The Builder.

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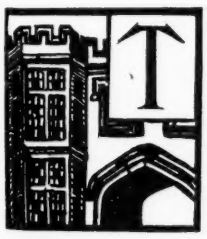
The Decoration of Westminster Palace.



THE publication of the Report of a Select Committee of the House of Lords* in regard to the decoration of their portion of the Palace of Parliament, its present condition and future possibilities, ought to be made an occasion to revive some interest in and enthusiasm for such an object.

The first portion of the Report recapitulates the history of the subject; the appointment in 1841 of a Committee of the House of Commons "to take into consideration the promotion of the Fine Arts of this country in connexion with the rebuilding of the Houses of Parliament"; its abolition with the change of Government shortly after, and the subsequent appointment of a Royal Commission, with the Prince Consort as Chairman, with a direction to enter on an inquiry "whether advantage might not be taken of the rebuilding of Our Palace at Westminster, wherein Our Parliament is wont to assemble, for the purpose of promoting and encouraging the Fine Arts in Our United Kingdom, and in what manner an object of so much importance would be most effectually promoted." Many of our older readers will remember something of the discussions which followed; the difficulties especially in regard to the employment of fresco painting (then in an experimental stage in this country); or those who do not remember may have read of them. Nominally the authority of the Board of Works was maintained, and the annual Reports of the Commission were all couched in the language of recommendation, but practically the whole control of the works in progress was exercised by the Commission itself. Much of what the Commission then did and recommended would not find favour now; its taste would be considered obsolete; but its aims were thoroughly good for the period in which it worked; and it was something to say, in this country, that such a Commission was in existence, and was reporting and recommending from year to year. With the death of its Royal Chairman the Commission came to an end; it was thought that no one could well follow the Prince Consort as Chairman, and that the Commission had so thoroughly laid down the lines of a general scheme of decoration that it might be carried on without further supervision. Accordingly the Commission was dissolved.

"How unfounded was the assumption on the faith of which this step was taken was very shortly shown. A few commissions already given were executed, a few of the plans already announced were for the next two or three years continued, but the regular and even progress of the past had ceased, and only occasional efforts were from time to time made to add to the works already completed. Amongst these the chief have been the statues in the Central Hall and the mosaic decoration of its vaulting. The Select Committee considered that one of their first duties was to ascertain how far the programme of the Fine Arts Commission, as shown in its Report for 1847 and subsequent resolutions, had as yet been carried out, and in what respect it still remained unfulfilled. They propose to state the results of their investigation by describing the actual condition at the present time of each room visited by them.

We have found some interest in going over the building afresh with the suggestions of the Select Committee before us. In considering what may be done for the completion of the decoration of the Westminster Palace, it is necessary to bear in mind that the existing work, whether or not it is what would appeal to our sympathies at present, was carried out, as far as it went, in one consistent style, and that it would be a grave mistake to introduce into it anything which is out of keeping with the prevailing artistic atmosphere. And when we take one of the portions which was entirely finished as intended at the time, such as the Library of the House of Lords, we cannot but be impressed with the exceedingly harmonious and satisfactory effect of the whole. It is not what would be done now; but would it be done any better now?

One of the suggestions to which we would first refer, and which is a general one, is that the paint with which the greater part of the interior stonework of the building has been covered should be removed. It is almost needless to say that we entirely concur in this. This painting of the stone is a piece of vandalism, which seems in many cases to have been done merely as the easiest way of brightening up portions of the House for a new Session. The different effect of the mouldings and details in

* The Committee consisted of Lords Beauchamp, Brownlow, Carlisle, Cholmondeley, Denman, Lytton, Plymouth, and Stanmore; the last-named being the chairman.

some portions in which the stone has either not been painted or the paint has been removed, is most striking. The painted stonework acquires a commonplace and stucco-like surface which has a deplorable effect.

We have not space to follow out all the separate suggestions of the Report, but will take some of the principal ones. On the Royal staircase are seventeen pedestals, forming part of the architectural design, but without any of the statues they were obviously intended to carry. The Committee draw attention to this, but think the supply of statues for them is "not an immediate necessity." To which we reply that English sculpture is very much in need of official patronage, and that the French Government would give, often do give, in one year, as many sculpture commissions as would fill all these pedestals at once. Let us at least make a beginning in the same direction.

The "King's Robing Room" is decorated with two pictures by Dyce, which in decorative quality are quite beyond most of the painting of his time; two spaces are still vacant, and ought to be filled with pictures in the same style; and in the adjoining "Queen's Robing Room" are three panels originally intended for paintings, now covered with what in the Report is called "flock paper"; it is really a smooth red paper with a fleur-de-lys powdering. These two rooms have a very good light, suitable for painted decorations; it is suggested that it would be better to attend first to rooms which are more seen by the public; a rather questionable principle; the rooms for royal occupation, one would think, ought to be the first consideration. The "Queen's Robing Room" contains a tempera painting of the defeat of the Spanish Armada, of which we saw not long since a reproduction in an American illustrated magazine; we take it that this is a copy of one of the old tapestries, referred to in another part of the Report, which were destroyed when the old Houses were burnt. It is odd that no reference is made to this curious work.

The "Royal Gallery" contains Maclise's two large and well-known paintings of the death of Nelson and the meeting of Wellington and Blucher; highly respectable work of their period, but not ideals of decorative painting. There are seventeen smaller panels unfilled. We rather agree with the suggestion that some of these at least should be left blank; it might even be well to allow the two large existing pictures to dominate the room. In the "Prince's Chamber" the scheme intended by the Fine Arts Commission has been carried out for two-thirds of the height with fairly good effect; there are twenty-eight upright panels filled with historical portraits in a sufficiently decorative style, and twelve smaller panels with bronze reliefs (oddly called in the Report "bronze carvings") of events selected for illustration by the Royal Commission. The six large panels near the ceiling have been temporarily filled with a fairly good decorative paper in a style not in keeping with the general scheme. The original intention was that these should be filled with tapestry reproductions of the lost tapestries before mentioned. Tapestries would look rather heavy in effect in that position. It would perhaps be better merely to treat these spaces with a decorative pattern, but the present one is not satisfactory, being out of harmony with the rest, and looking too obviously temporary.

The large Committee room, called colloquially "the Moses Room," is decorated with two large paintings by Herbert, of which the one of Moses coming down from the Mount would surprise those who only remember Herbert by his later paintings which used to be such a joke at the Royal Academy; it is a really grand work in composition, and not bad in colour. The other, "The Judgment of Daniel," is very inferior and very different, too, in style and texture, though the architectural background is interesting. There are five other panels (not so large) unfilled in this room, which certainly ought to be completed in its pictorial decoration.

In the Central Hall the completion of the two remaining panels with mosaics, to range with the two already executed (St. George and St. David) is of course imperative; it is a kind of national disgrace that it has been so long delayed. Albert Moore's designs for them were made forty-one years ago, and are still waiting to be carried out! The Commission intended that this Hall should have four seated statues of great English Statesmen. We agree that their decorative effect would have been better than that of the existing standing statues, each of which, by the way, is placed exactly in front of a doorway. And at all events the statues ought to have been tinted to a tone more in harmony with the general effect; at present they are raw white patches in the scheme. The experiment of toning the statues with a slight colour has been tried in one or two more recent works, with good results. The general effect of the halls and corridors is so sombre, either from the smallness of the windows or the character of the stained glass, that sculpture requires to be toned down from crude white to avoid appearing harsh. This sombre but rich effect in the interiors is in keeping, however, with the general style of the building. If Barry had been allowed to carry it out as a Renaissance building, as he would of course have preferred, the interiors would no doubt have been lighter. But the Government of the day would have Gothic, and with it they have the traditional "dim religious light"; and it is no use to fight against this now. But the existing stained glass in the Central Hall is, as the Report says, bad (from the present day point of view) and unnecessarily dark and heavy. A better and less heavily coloured glazing might be substituted with good effect; glass at all events is a thing that can be altered without interfering with the structure, and it is absurd to be tied down to work executed at a time when the art was little understood. Only any such glass must be in keeping with the prevalent style of the building. It would never do to have the last fancies in neo-Renaissance imported.

In St. Stephen's Hall the twelve statues contemplated by the Fine Art Commission are all in place, and the windows fitted with stained glass approved by the Commission (and better than that in the Central Hall), but the panels under the windows and between the statues are still covered with a diapered paper, which we quite agree has a mean effect. The Report states that these panels were intended for paintings, in the original scheme, but that would not do under the stained windows, though we are told that some of the witnesses recommended it.* We should say, either sculpture subjects in very low relief, or possibly decorative subjects in marble inlay, with few and rather subdued colours.

The Dining-Rooms have a splendid light—perhaps rather too much, and were all intended to be painted in panels, none of which painting has ever been executed. Landseer was commissioned to paint four, the well-known "Monarch of the Glen" having been one of them, but the commission was quashed—we are not told why. But this is a part of the decoration which certainly should be carried out, and would afford a fine opportunity to some of the artists of the present day. The Upper Stairs Lobby, formerly known as the "Poets' Hall," from the fresco portraits of great poets on its walls, is in a deplorable condition; the frescoes have almost perished, and two telephone boxes, rightly described as "of portentous ugliness," are placed in two corners of the room. We should like to know under what First Commissioner these monstrosities got in. It would not have cost much to have got a design made for something in accord with the architecture of the building. In this Lobby and the one below it the five fireplaces are cut off from their proper use and appearance by tables for light refreshments being placed in front so as to enclose them, with a very absurd effect.

It appears from the Report that of 161 panels intended to be fitted with painting, 57 have been so filled, and 104 remain to be filled. Of the statues contemplated, 23 have been executed, and 27 have yet to be provided. As to the future, the Report recommends that a permanent Advisory Committee be appointed to carry on the work, instead of leaving it to the Office of Works and the chances of the First Commissioner taking an interest in it. The Committee point out, with dry sarcasm, that not only is the First Commissioner (who is selected partly for political reasons) under the temptation to seek the praise of being an economical administrator, but that "if he be a man who not only has no knowledge of art, but actually despises and dislikes it, not only will any future decorative work be brought to a standstill, but works of artistic beauty already completed may be removed or destroyed, sacrificed to what he deems the claims of comfort and convenience." Those who remember some First Commissioners know too well how true this is; but what a satire on our country that it should be possible for such a statement to be true!

As to the means, 4,000*l.* a year was the sum put at the disposal of the original Fine Art Commission, and it is pointed

* The evidence taken before the Select Committee is not yet published.

out that "if only half that sum had been spent annually during the forty-five years since the Commission ceased its labours, the decoration of the interior of the Palace would probably now be complete." It is proposed that this annual sum should again be asked for, and the Committee express a hope that the people of this country would not grudge this small expenditure on completing the decoration of our greatest national building. We hope not; but one has to reckon with the House of Commons, and we know how difficult it is to get any sum voted for art in that assembly. And we should say that, considering all the years during which nothing has been done, there ought to be an expenditure of a much larger sum in the first instance, to bring up arrears; leaving the 4,000*l.* a year to fall back upon for a permanency.

The Report touches also on the subject of Westminster Hall, as an approach to the House, though with a doubt whether it comes within their reference. Apparently the Fine Art Commission did not consider that it came within their province, and therefore nothing has ever been done beyond the projecting into it of those foolish staircases with the "fearful creatures" on them. We quite agree with the Committee that the few statues now in the Hall, not originally intended for that position, are quite out of place there; more than "out of place"; they are absurd. It is a great pity that some real use is not found for that grand and historic Hall, at present mostly a desert; and at all events something should be done to relieve the nakedness of its walls. If we only had a "Gobelins" in England, nothing better could be done than to hang it with grand tapestries commemorating great events in decorative form, like those designed by M. Toudouze and other eminent artists for the French Government. It would be worth establishing an English "Gobelins" to carry out such a work.

ST. PAUL'S CATHEDRAL.

THE Report by SirAston Webb, Mr. Belcher, Mr. Collcutt, and Mr. Macartney (the present "Surveyor" to the Dean and Chapter) on the state of St. Paul's Cathedral, gives in the first instance a very good summary of the history of the difficulties in regard to the foundations of the Cathedral, and of the investigations and reports that have been made at various periods, chiefly by the successive surveyors to the fabric. A comparison of these leads at once to the conclusion that the kind of scare which has been set up as to the condition of St. Paul's is very much exaggerated, and that, as suggested in our "Note" of April 20 last, some of the dislocations in the structure date from a very early period, the piers of the dome having in fact sunk to some extent under the pressure of the superstructure even before the date when the topmost stone of the dome was laid, and required some immediate repairs of the fractures caused by the great weight upon the masonry. And the conclusion in the Report is that settlements in these piers have continued in some degree to the present. Of the very *live* state of the building in this respect a curious instance is given in the information quoted in a footnote as given by Mr. Harding, the Clerk of Works at the Cathedral, that when the pilasters of the choir were veneered with marble, as part of the modern scheme of decoration, the stone splintered and flew in all directions when cut, owing to the great compressive stress it was under: "in one instance a large piece of stone flew out in the absence of the workmen." Mr. Somers Clarke's Report of 1902, from which a quotation is given, states that the sinking of the piers on which the mass of the dome rests has cracked through the arches and window heads of the east and west sides of the south transept. This, however, was an old dislocation, as Mr. Clarke refers to the fact of iron ties having been inserted "about 100 years since" to prevent it from spreading further. The present Report notes that the clearstory windows nearest to the dome are much distorted—"the sills all slope in the direction of the dome itself, and have been levelled up"; and that above these windows the whole wall has followed the same inclination. The photographs given in Appendix IV., and referred to in this connexion, do not, however, show very clearly or conclusively what is here referred to; and in fact, photographs, except of small portions shown on a large scale, are not in general very reliable or intelligible illustrations of points of this kind, as they are so much subject to distortion in themselves. A measured and figured elevation would have been more conclusive evidence for the reader. The photographs of some of the cracks in the buttresses of the dome—the half-hidden arches behind the colonnade of the drum, are much more to the purpose as illustrations. These all show that the inner portion of the arch, more immediately connected with the weight-bearing portion of the masonry, has been slightly pulled down and parted from the exterior portion, which only carries the gallery entablature and balustrade. All these are natural and not uncommon results of the concentration of immense weight transmitted by piers bonded to the rest of the structure, and resting on a foundation which was from the first somewhat unsatisfactory and variable in its character.

The important question, after all, is not these existing fractures and dislocations, which, if the foundation were now unassailable, would not be likely to increase, but how the foundation is to be kept secure from movement. Wren, as mentioned on the first page of the Report, considered that the flow of water in the gravel stratum tended towards the river, and that probably there had been no divergence or interruption of this flow for centuries, and therefore would not be in the future. A footnote to the Report at this point states that "according to our observations, the trend of the water is more in the direction of Ludgate Hill," but no detailed grounds are given for this opinion. It is by no means impossible that the building of a new sewer on the south side of the church early in the XIXth century may have had the effect of diverting the flow of water in some measure from the direction of the river towards Ludgate Hill. It is suggested in the Report that the sewer "probably had the effect of disturbing the even flow of water," but of course this is nothing more than surmise, and so is the remark that various alterations along the riverside south and west of the Cathedral have influenced the flow of water in the lower strata above the London clay.

We think it very likely that since the fabric was built the underground water level has been lowered by excavations for building purposes, and by the pumping operations conducted during the construction of the District Railway. If the strata originally permeated with water were unable to spread laterally they would form sound beds for a foundation, and if any of these strata were so constituted that the water contributed to their resistance, the abstraction of fluid to an important extent would, as Mr. Penrose said in 1890, "cause a very considerable collapse in the strata themselves." Another danger which always threatens sandy soils in the presence of running water, whether the flow is natural or its velocity is due to artificial causes, such as pumping from excavations, is that particles may be washed away and thereby give rise to subsidence. Before any reliable opinion could be formed as to what has actually taken place in the strata beneath the foundations of St. Paul's it would be necessary to have retrospective data, which cannot now be obtained, as well as accurate data referring to the present state of things. Hence we do not see that any definite conclusion can be drawn from consideration of the theories which have been put forward concerning the probable lowering of the water level.

From the wording of some passages in the Report it may perhaps be thought that more significance is attached to the even flow of water and to free percolation in the substrata than to reduction of water level. By referring to the concluding paragraph, however, the reader will find that the inference is one which the authors of the Report did not intend to be drawn; but, in any case, we may just as well point out that the flow of water through permeable strata, and especially strata composed of fine sand, is not in itself a desirable circumstance. Sandy soils are not usually affected by stagnant water, but there is always a risk that sand will be carried away by running water. The Report tells us that in 1831 Mr. George Rennie, the Engineer, Mr. Robert Smirke, the Architect, and Mr. Cockerell, the Surveyor to the Dean and Chapter, jointly reported against the construction of a sewer along the south side of the churchyard on the ground that "however carefully the work may be constructed it will be impossible to prevent some degree of motion from taking place in the side stratum of sand and gravel." Again the Report tells that in 1874 Mr. Longman, the author of "The Three Cathedrals of St. Paul's," wrote:—"If this bed of sand were pierced by a drain there would be a great probability of its running off and leaving the pot-earth insufficiently supported." The fear in 1831 and in 1874 was that the sand,

and not the water, would move or run off. That is a danger which can only be increased by the free flow and percolation of water.

On the other hand, as the bearing power of soil can be increased by draining, we may find encouragement in the thought that the strata more immediately below the foundations of St. Paul's are above water level. Of course, the proper time for draining soil for foundations is before commencement of building work, for there would be risk of movement if drainage operations were undertaken afterwards. We have some reason for believing that this is what has been done unintentionally in the case of the Cathedral. Movement of the substrata and the foundations has taken place, but is no longer taking place, at any rate to an important extent. Hence on the hypothesis that the subsoil has been effectively drained the foundations ought logically to be more secure than they were under previous conditions, although not so secure by any means as could be desired.

Three sections of borings given in an appendix to the Report do not suggest cause for immediate uneasiness or alarm. Boring No. 1, made on the south side not far from the western door, showed that no sand existed below the water line, the layer of fine sand beneath the gravel and clay which underlies the pot-earth being 15 ft. above the water level. Boring No. 3, in the south transept, indicated the presence of sharp dark and red sands and gravel below water level, but no fine sand nearer than 7 ft. above the same level. Boring No. 2 was of less favourable character, as a 2 ft. bed of fine light sand is crossed by the water line. We fully agree with the wisdom of the recommendation that "the condition of the subsoil and the state of the water level be carefully watched and periodically recorded." The records so obtained, taken in conjunction with others to be furnished by observations as to the structural condition of the church in accordance with the scheme formulated by Messrs. Barry and Leslie, ought to afford valuable guidance and lead ultimately to trustworthy conclusions with regard to the whole question. At present the Committee do not favour the idea of underpinning or of screening the foundations in the manner we suggested a few months ago. It may be that facts will come to light in due course showing that remedies of the kind are not required. On the other hand, we cannot avoid the feeling that in view of the extremely sensitive, or *live*, condition of the structure it would be very desirable to make the foundations absolutely secure, and independent of the various natural and artificial causes which probably will always continue to affect the stability of the substrata and to keep the fabric in a more or less mobile condition for which it was never designed, and which can only be a source of constant anxiety.

In conclusion, we entirely concur with the tribute, contained in the last paragraph of the Report, to the constructive skill of Sir Christopher Wren. The unexpected strains developed by altered conditions of the subsoil, and the wonderful manner in which those strains have been resisted by the fabric, serve to remind us that the great architect was equally great as a scientific engineer, and the latter-day history of St. Paul's imparts a new meaning to the well-known epitaph, "Si [monumentum requiris, circumspice."

NOTES.

The Quebec Bridge Disaster.

By the irony of fate we received, on the same day which brought the tidings that the southern end of the Quebec Bridge had fallen into the St. Lawrence River, a copy of the *Engineering Record* containing an article wherein the methods of construction adopted by the contractors are cited as a proof of the advances made in bridge erection since the building of the Forth Bridge. Referring to the main trusses our contemporary says that "the degree of excellence to which shop work of this class has been developed is effectively shown by the fact that these great bridge members were never assembled after fabrication in the shop until they were placed in the actual structure with complete accuracy." The writer adds that this is in marked contrast to the system adopted at the Forth Bridge, where every member was completed in the workshops provided on the site. It is very unfortunate for American bridge builders that we now have another "marked contrast," which takes away all justification for patronising comment on the careful methods of construction followed by Sir William Arrol, under the personal direction of Sir Benjamin Baker. The Forth Bridge did not fall down when it was half built. Notwithstanding the precautions taken by the contractors for the Quebec Bridge, something appears to have been wrong in the work. On Thursday last week one of the stringers was found to be twisted, and on the day of the accident it was reported among the workmen that some of the riveting was unsafe. These facts point to the conclusion that the collapse was not primarily due to "the overloading of a construction train," as suggested in a press telegram. Whatever the actual cause or causes may have been, it appears that the anchorage of the shore cantilever arm failed in some way, thus permitting the unbalanced weight of the projecting river cantilever arm to dip into the water, and to drag forward the other portions of the work, the destruction involving 800 ft. of the steel superstructure.

The Trade Union Congress.

THE Trade Union Congress opened its fortieth session at Bath on Monday last, a larger number of delegates being in attendance than at any previous Congress. In this week's issue we can only comment on the annual Report of the Parliamentary Committee. Recent legislation has given the Trades Unions so many of their desires that the Report has had to be pitched in a less militant key than of late years, and its congratulatory spirit may well be pardoned. "Oliver" is, however, not unnaturally, already "asking for more," and the programme of reforms embraces Old Age Pensions; Miners' Eight-hours' Day, and a Reduction of Hours in all Trades; Legislation for the Unemployed; Amendment of the Poor Laws; State Insurance; Land Nationalisation: and Legal Restriction of Overtime. In reference to Old Age Pensions the Report states that any pension scheme must be upon a non-contributory and non-discriminatory basis in order to be satisfactory to the working classes, the Government Blue-book on the subject being unsatisfactory to the Trades Unions on account of the prominence given to schemes involving thrift. A consideration of these sentiments taken in conjunction with the above programme may well give rise to the fear that the working classes may one day suffer from atrophy of everything but the vocal chords.

Workmen's Compensation Statistics.

A BLUE-BOOK relating to Workmen's Compensation in 1906 has just been issued, but, as has been pointed out before, the statistics it contains are necessarily imperfect owing to the absence of any compulsory returns in relation to compensation for accidents. In England and Wales 1,718 cases were dealt with by judges and arbitrators, as compared with 1,754 in 1905, and 814 cases were settled or withdrawn. Compensation was awarded for death in 553 cases, the compensation paid in respect of these fatal cases amounting to 105,454*l.*; these figures compare with 538 fatal cases in 1905, the compensation in respect of which amounted to 101,983*l.* The vast number of cases which were settled without the intervention of the Courts, and where the injuries have not proved fatal, cannot be accurately estimated. Statistics on this subject would be very valuable, and it is to be regretted that in the new Act it was not made compulsory, when any payment under the Act is made, to register a memorandum. The new Act marks one step in this direction, for it provides that agreements redeeming weekly payments and agreements as to compensation paid to persons under disability or to dependants shall not, unless registered, exempt the person by whom compensation is payable from liability.

New Electrical Regulations.

WE have received from the Home Office a draft of the new regulations for the generation and distribution of electrical energy. In accordance with the requirements of the Factory Act the regulations are now published in draft, and are subject to further consideration. They will come into force on January 1, 1908. The proposed regulations we consider in many respects admirable, and they will tend to diminish the annual number of electrical fatalities which has increased rapidly during the last few years. The fact that even low electrical pressures can be dangerous is at last fully recognised, and the precautions specified to safeguard the public seem to us to have been well considered, and although no legislation can safeguard the foolhardy employee, a perusal of the instructions—for the treatment of persons who have received an electric shock—which have to be affixed in a prominent place in all generating stations, may make him think. For many years we have pointed out the dangers of electric shocks from low-pressure circuits and the practical

impossibility of enforcing the present Board of Trade regulations under the Factory Act. We are glad, therefore, although somewhat surprised, to find that the advisers of the Secretary of State have seriously grappled with the question, and congratulate them on the thoroughness of their remedy. In our opinion, however, the wording of the Act might be amended considerably with advantage. For instance, it is stated that "*Earthed* means connected to the general mass of earth in such manner as will ensure at all times an immediate discharge of electrical energy without danger." This seems to be a slightly amended definition from the rules of the Institution of Electrical Engineers. It applies fairly accurately to lightning arresters on telegraph or power-transmission wires. It seems to us that the framers of the regulations mean by "earthing" connecting a conductor with the "earth" in such a way that the pressure between it and all neighbouring conductors can never be so high as to give a dangerous shock. The definition given is exceedingly clumsy, and cannot be justified on any scientific ground.

The Strength of Concrete-Steel Slabs and Beams. SOME recent full-sized tests of a concrete-steel floor in Kansas City, by Messrs. A. E. Lindall and G. R. Heckle, throw useful light upon the resistance of the slab and beams incorporated in the structure. The slab was designed for the ultimate load of 600 lb. per sq. ft., but its virtual failure, as indicated by the rapid increase of deflection and the extension of cracks in the soffit, did not take place until the load of 900 lb. per sq. ft. had been imposed. While the slab was being tested the main and secondary beams were supported by struts, and after the destruction of the slab the beams were separately tested, with the results that the secondary beams were found to be capable of supporting 23 per cent. more than the calculated breaking load, and that the main beams were able to carry 13 per cent. more than the calculated breaking load. Unfortunately the Report of these tests in the *Engineering Record* of July 20 last does not state very clearly the basis upon which the computations were made, but it demonstrates in a general way the fact that the strength of slabs is 50 per cent. greater than that indicated by beam formulæ, and that a considerable margin of excess strength exists in beams.

Modern Vindication of Brunel. ALTHOUGH Stephenson very speedily won the "battle of the gauges" in the early part of last century, the victory has proved a disastrous one for railways generally, and especially for those of Great Britain and America. The limitations imposed by the present standard gauge of 4 ft. 8½ in. stand in the way of development, and engineers are beginning to foresee difficulty in the design of sufficiently powerful locomotives for dealing with traffic requirements of the future. In the United States one of the most prominent railway magnates has gone so far as to say that a broad gauge of 6 ft. or 7 ft. must ultimately be adopted in that country, to enable railway companies to deal with the rapidly-increasing amount of passenger and goods traffic. To make the change now would necessarily involve the rebuilding of every tunnel, viaduct, bridge, and station, and the increase of axle loads would probably involve a new method of track construction on the principle actually adopted by Brunel on the Great Western Railway. Whether a new "battle of the gauges" will ever be fought in Great Britain we should not like to predict, but it is a significant fact that our contemporary, the *Scientific American*, should express the opinion that "the day is undoubtedly approaching when the engineers of the future will widen the gauge, being driven to it by the stress of stern necessity." In respect of railways, as of other engineering work, the policy of Brunel has been amply vindicated by modern progress, and it is much to be regretted that his wise counsels were not appreciated and adequately supported by past generations of engineers.

Coast Protection at Hornsea. AN interesting example of reinforced concrete construction is afforded by the new works at Hornsea on the Holderness coast of Yorkshire, where the cliffs consist of friable glacial drift very susceptible to attack by the sea. The protective works, recently completed from the designs of Mr. W. T. Douglas, M. Inst.C.E., comprise a concrete sea wall, surmounted by a promenade of concrete reinforced with expanded metal, above which is a concrete retaining wall in front of the cliff, reinforced in a similar manner. With the object of encouraging the accretion of beach material three new timber groynes have been built on the foreshore, their lengths being 400 ft., 410 ft., and 850 ft. respectively. The only respect in which the protective works might have been improved would have been by the application of reinforced concrete in the construction of the groynes. The material in question is admirably suited for this purpose, being far more durable than timber and iron, and lending itself to the increase of height rendered necessary after a time by the accumulation of littoral drift.

Winklebury Camp, North Hampshire. MR. C. F. DOWSETT has just disposed to a private purchaser of his residential estate upon the chalk range which rises to an altitude of some 400 ft. at Winklebury. The property, extending over about 215 acres, embraces a house and grounds surrounded with beech-trees, and a highly interesting fort or camp of great antiquity. The entrenchment, or ring, of 12½ acres in area, has a fosse, with scarp, counter-scarp, and ramparts about 35 ft. high. In the opinion of General Pitt-Rivers, who discovered there an Anglo-Saxon cemetery, the fort has undoubtedly a præ-Roman origin. The round camp lies in a field along the east side of the ancient, probably Roman military road—the Herepathe—whereof the track may yet be followed across all the county from Southampton to Silchester. The Herepathe is still a good road at Winklebury, where it passes between Worting and Basingstoke, and is crossed, in the vicinity, by the main roads from Basingstoke to Andover and Salisbury, to Winchester, and to Kingsclere and Reading. It is believed that the fort existed in a period long antecedent to that of the Roman occupation; early remains have been found there, embracing a burial-mound and what are taken to be the horns, teeth, and bones, burned for sacrifice, of the *bos longifrons*, or Keltic short-horned ox, a species which, we are told, lived from the latter Neolithical age to the close of the IVth century. In the IXth century it was the stronghold of Ethelred and Alfred, sons of Ethelwulf, who, it is said, marched out of the camp at the head of the men of Wessex to meet the Danes, who had advanced from Reading, at Basing, three miles distant. The Parliamentary forces held the camp in 1643-5 when they besieged Basing House.

Fulham Parish Church. A FUND is opened for the restoration of the tower of All Saints' Church, the rehanging and quarter-turning of the bells, and the erection of a commemorative tablet—the whole scheme constituting a memorial to the late Archbishop Temple. The early XVth-century tower rises to 95 ft.; it has a turret at the south-west angle and battlements; it was restored by George Godwin, F.R.S. The west window, with flowing tracery, is a modern insertion. In 1839-40 Edward Lapidge enlarged the church at a cost of about 2,000*l.*; twenty-five years ago the entire body of the church was rebuilt after designs by Sir A. W. Blomfield. In our issue of August 20, 1898, we illustrated the late A. H. Skipworth's design for the chancel screen, in wood. The peal of ten bells, which rank amongst the finest and softest toned church bells in England, is a casting, or recasting, by Ruddle in the middle of the XVIIIth century. Each bell has an inscription; on one is, "John Ruddle cast us all." The monuments and tombs are many, and of great interest; amongst the oldest are the lozenge-shaped brass (1529) of Margaret, wife of Gerard Hornebolt (or Hornband), of Ghent, the painter, and in the tower that of Henry VIII.'s physician, Sir William Butts. Close to the latter are the statue of John, Lord Mordaunt, by Francis Bird, and Grinling Gibbons' monument to Dame Dorothy Clarke and her second husband, Dr. Samuel Barrow.

Alexander Thomson Travelling Studentship. THE name of the eminent Glasgow architect who was known in his day as "Greek Thomson," from the special line which he took up of adapting Greek architecture to modern buildings, was to be perpetuated by the establishment of the "Alexander Thomson Travelling Studentship," to be competed for every third year, and to be open to architectural students between the ages of nineteen and twenty-eight, residing in the United Kingdom. The competition comes round next year, prizes of 60*l.* and 20*l.* being offered for the best and second-best sets of drawings to be sent in on December 28, 1908; which is certainly allowing ample time. The subject is a City Church on a site measuring 350 ft. by 250 ft., open all round. There is also to be a Clergyman's House and a Session-house or Clergy Room, "connected under cover with the church buildings." This is rather a vague wording, as it does not clearly define

whether the House and Session-house are to form a separate block connected by a covered-way with the church, or whether the whole is to be treated as one architectural block. It is stated that "the style of the buildings is to be Classic," but it is apparently not limited to the Greek form of Classic architecture. One is inclined therefore to ask—Is it the object of this competition to keep and develop the particular school of neo-Greek which Thomson himself practised; or is it intended only to develop church architecture of a Classic school, whether Greek, Roman, or Renaissance? It is rather important that this should be understood, for it would make a great difference in the problem set before the competitors. Our own impression is that it would serve little purpose to endeavour to perpetuate the style of architecture practised by Thomson, which hardly in the present day commands the admiration that was given to it when the buildings were new. Thomson was a very able man and deserved the position which he attained. But his buildings look rather cold and formal to the eyes of the present generation of architects, and may be said to represent a phase of modern architecture which has had its day.*

Architectural Association.

AMONG the subjects to be treated of at the ordinary meetings of the Architectural Association, the complete list of which is given on another page, there are two which ought to stimulate thought in regard to the ideal or philosophical side of architecture. One is that promised by Mr. Halsey Ricardo on "Sentiment in Architecture." There can be no doubt that the lack of that quality is one of the most serious deficiencies in a large proportion of modern buildings; but though we can feel its absence, how are we to define its presence? It is—or so one would fancy—one of those evanescent qualities which it is almost impossible to define

"In matter-moulded forms of speech."

One may give examples of buildings which have the quality of sentiment, and of those which have it not; but one can hardly put one's finger on the special details which go to give sentiment to a design. At all events, what Mr. Ricardo has to suggest on the subject is sure to be of interest. The other subject to which we refer is Mr. Lewis Day's on "Originality and Tradition in Design." This is also a purely æsthetic subject, but it is more within the grasp of language and argument than the other; and it is of special interest at the present time, when there is so muchquestion raised as to the extent to which modern architecture should depend on traditional forms. Such a subject should arouse an interesting discussion.

ST. STEPHEN'S CHURCH, BOURNEMOUTH.—A tower is being erected on the north side of this church. It is being built of Swanage stone, with Corsham stone dressings, and will rise to a height of 119 ft., while the spire will be 100 ft. high, making 219 ft. in all. The spire will be entirely constructed of specially selected Corsham stone. The architect for the work is Mr. F. L. Pearson, who was the architect for the church, and the contractors are Messrs. W. Cowlin & Son, of Bristol.

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* Full particulars of the competition may be obtained from the Secretary, Mr. C. J. Maclean, 115, St. Vincent-street, Glasgow.

LETTER FROM PARIS.

FOR a long time already we have been expecting the demolition of the fortifications of Paris, especially of the portion adjacent to the Bois de Boulogne, but as the Government and the Municipality cannot agree together as to the value to be placed on the land, the affair keeps hanging on unsettled. A beginning has however been made, as the pickaxe of the *démolisseur* is at work on the portion of the wall between the Porte des Poissonniers and the Porte de Clignancourt. This is in preparation for the erection of barracks here which will permit of the abandonment of the Caserne Napoléon, the troops from which will be lodged in the Caserne Château d'Eau. The Caserne Napoléon, which is on the Place Lobau behind the Hôtel de Ville, will become a new annexe of the municipal palace, which is too small for its requirements, and which will thus be entirely transformed in the portion of the façade bordering on the Rue de Rivoli. Here will be installed the Services of the Conseil-Général and the Conseil Municipal. A large Sessions-Hall (*Salle des Séances*) is to be formed here, with public galleries and a semi-circular flight of steps, as at the Chamber of Deputies. The present Hall, which is inconvenient, and defective both as to ventilation and acoustics, will be transformed into a Salle des Fêtes. This large scheme, which has in general principle been already adopted, will necessitate a considerable outlay, and will take several years to complete, after the necessary funds have been voted.

It is announced that a young sculptor M. Larrivé, at present a student at the Villa Medici, has been commissioned by the Vatican to execute a bust of Pope Pius X., who has consented, as an exceptional case, to give the necessary sittings. The bust will probably be exhibited at next year's Salon.

Gambetta, to whom there is already a monument by Bartholdi at Ville d'Avray, where he died, is it appears to have another monument, jointly with Danton, at Sèvres. Danton is a revolutionary hero already statufied at Paris, on the Boulevard St. Germain. One rather pities the sculptor who will have to combine in one composition the figure of Gambetta, in modern dress, with that of the Tribune of 1795.

The surveillance exercised at the Louvre does not suffice to prevent the perpetration, from time to time, of acts of vandalism which are a serious danger to our national collection. The wanton injury done to Poussin's "Déluge," some months ago, will be remembered; and recently a similar injury has been done, by some unknown hand, to one of the best landscapes of Nicolas Berghem. A recurrence of this kind of thing becomes alarming.* Thanks to the ability of the staff of the Louvre, the remains of Poussin's picture have been removed successfully and replaced on a fresh canvas, and the public will shortly be able to see the result of this delicate process. But it is evidently desirable that the Government should take serious measures for the protection of the pictures by increasing the number of custodians, and also that the Council should increase the staff of guardians in the municipal museums, at present very insufficiently protected. The Carnavalet Musuem, which contains such precious relics of Paris history, is subject also to another kind of risk, in the immediate proximity, of a factory of chemical products, the least carelessness in which might bring about disaster. There is talk of enlarging the Carnavalet Museum; it would be better in the first instance to take steps to preserve it.

Two pictures by Chardin, purchased from the recent exhibition of the works of Chardin and Fragonard, have been added to the Louvre collection.

At one of its last sittings the Académie des Beaux-Arts awarded the Leclaire Prize, which this year has been divided between two young architects, M. Leon Laprade and M. Heinzelmann, pupils of M. Redon.

The Société Centrale des Architectes Français has lost its oldest member, M. Jules Louis Bouchot, Honorary Architect to the Department of Bâtiments Civils, and Officier of the Legion of Honour. M. Bouchot, who has died at the age of 90, was nephew and pupil of Alphonse de Gisors, architect to the Luxembourg. He entered the Ecole des Beaux-Arts in 1834, and the Société Centrale in 1848. His life was entirely devoted to his work. Amongst the numerous buildings which he carried out may be mentioned the Palais de Justice at Tarbes (1850); the Château of M. Paulin Talabot, at Roucas-Blanc, near Marseilles; the chapel of the Ecole Normale Supérieure, Rue d'Ulm; the Hôtel of the Société Générale, Rue de Provence; the offices of the Paris, Lyons, and Mediterranean Railway, Rue St. Lazare; the railway terminus at Nice; the docks of Marseilles; the Ministry of War, Boulevard Saint-Germain (1868 to 1883); the restoration of the Odéon; the Hôtel of the *Journal Officiel*, Quai Voltaire; the Hôtel Fould, Faubourg St. Honoré, subsequently purchased by the Duc d'Aumale; and, lastly, the fine railway station at Milan, of which he was very proud, and which has served as a model for various other large terminal stations.

* Since the above was written the following appeared in Wednesday's *Times*:

"At the Louvre to-day (September 3), shortly before the museum was closed, a girl stabbed a picture by Ingres entitled "La Chapelle" with a pair of scissors, the eyes of the Pope and the faces of three Cardinals being cut through. On being questioned, the girl said that she wanted to be arrested. M. Dujardin-Beaumetz, Under-Secretary of State for Fine Arts, has since had a conference with the Conservators of the museum and the Commissaries of Police as to what measures can be taken to put an end to such mutilations."

THE ANNUAL MEETING OF THE CAMBRIAN ARCHÆOLOGICAL ASSOCIATION.

THE sixty-first annual gathering of the members of this Society was held at Llangefni, a small town almost in the centre of the island of Anglesey, during the week commencing the 26th ult. The retiring President was Sir John Williams, Bart., who gives way for this year to Sir Richard Williams-Bulkeley, Bart. There was a large attendance of members, and a gratifying feature was the appearance of several important members of other kindred societies, notably Sir Henry Howarth, President of the Archæological Institute.

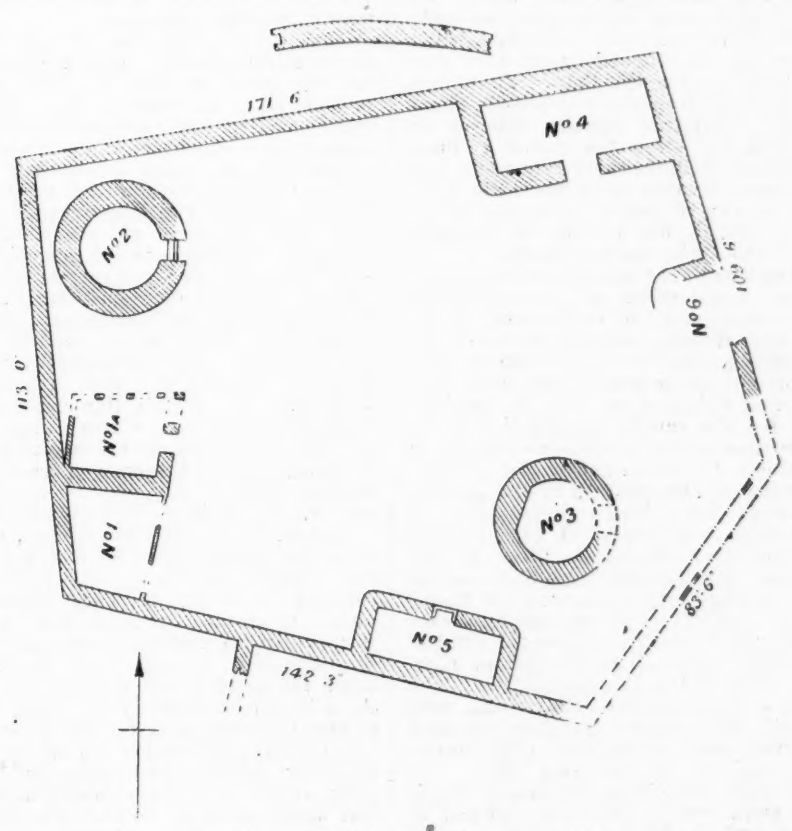
The county of Anglesey has been visited by the Association upon only one previous occasion, namely, in 1870, when the meeting was held at Holyhead, at the extreme north-western point of the island. The area covered upon this occasion was, therefore, practically new ground. But it should be said that this apparent neglect of some of the most interesting districts of the county did not proceed from any sense of depreciation, but was occasioned rather by the absence of good means of communication, the single line of railway that traverses the island from north to south being far from most of the important antiquarian remains, and the country roads being extremely bad.

Anglesey is a veritable Tom Tiddler's ground to the prehistoric archæologist, but those whose studies are confined to other and later periods and remains will find much of the greatest interest, possessing in addition to their intrinsic claim for attention the charm of novelty. Early stone and earthen camps abound, cromlechs and meini-hirion (standing stones) are numerous, all betokening the continuance of primitive conditions of life in these islands during a far longer period than in the richer and more rapidly civilised country of England. The churches partake of the same stamp of simplicity and of remote antiquity, even when, as is too often the case, they have been mercilessly restored. There is not one that, from its size, would not be disdained by a modern self-respecting English town, but there is not one that does not possess some feature that will well reward the close attention of the wandering English antiquary. Of mediæval remains the district coming within the ambit of the Society's peregrinations is almost entirely devoid. Beaumaris, a first-class Edwardian fortress, stands by itself, as a mark not of Welsh life, but of English domination, was outside the visitors' "sphere of influence," and is, indeed most easily visited from Bangor, on the opposite shores of the Menai Straits. Lleeniog Castle, an interesting minor fort, was also beyond a visit. Domestic architecture is as ill represented. Nothing remains that is earlier than the first half of the seventeenth century, and what is left possesses neither distinction nor beauty. The churches are the distinctive and often the only memorials of antiquity (apart from the prehistoric remains already alluded

to) that the traveller will meet. They are of one uniform type, the variations of and additions to which are clearly the work of later generations, and are as a rule somewhat incongruous with the original edifices. The greater number of those that still bear marks of their mediæval origin are, in their main structural features, of the early XVth century. It is clear that the half century between 1370 and 1420 was a great period in Anglesey for the reconstruction of its parish churches, and it was followed by an almost equally active period from 1470 to 1530, when the confusions produced by the policy of Henry VIII. seem to have effectually stifled all efforts towards church restoration or renovation. The earliest form of Christian church in these islands, the small circular stone oratory still to be found in the south-west of Ireland, has no existing representative in Anglesey. Whether this was succeeded by a form intervening between the VIth or VIIth centuries, the great period of the Celtic church, and that usually known as the Norman period—a distance of time that may be computed at little short of 500 years—there is nothing in the oldest edifices to witness to. And of the structures built either under Norman influence or example the traces are few and by no means conclusive. In some cases a feature remains that we are at once inclined to dub as Norman, such as the chevron ornament at the church of Llanbabo, the chancel arch at Holyhead (not visited on the present occasion), or the tower of Llaneilian; but these may prove only accidental "harkings back" to a fashion long gone past, and a round arch with a simple chamfer may, apart from other testimony, be the work of the XVIIth century, and not of the VIIth. Enough, however, remains to show that the small village churches of the county tended to one type, that of a single chamber of from 20 to 30 yds. in length, probably without structural division, and between chancel and nave. A few churches of this type still remain. But the greater number display an advance not so much in the direction of greater size and dignity as in the clear structural and ritual division of the portion allotted to the sacred ministrations of the priest and the part allotted to the congregation. Western towers are almost unknown, and where present may be regarded as undoubted signs of external, that is non-Welsh, influences. The regular western termination of the churches was, and remains, a blank wall, the roof angle crowned with a small bell-cot. The western gable is usually broken by neither window, nor loop, nor doorway, the entrance being almost universally by a doorway on the south side, which is frequently protected by a rude porch. There is no instance of an eastern window of earlier date than the Decorated period, and where the Decorate dwindow has been preserved it is usually of a charmingly simple and graceful character. As a rule, the Perpendicular work is poor, and in marked contrast to the general artistic excellence of the earlier period. It is to be deplored that ever since the restoration of the pre-Reformation churches became either a necessity or a craze, the word has connoted in Anglesey an almost complete, in several cases an absolutely complete, destruction of the older edifice, and its replacement by what is in every respect save one a modern structure, bearing just such an external resemblance to the old as a XXth century man in pyjamas displays to his ancestor of the Druid period. The one point in which the modern restored Anglesey parish church has followed the old is its size. The exigencies of the church in Wales in the country districts have not up to quite recent years called for "extensions," so that the restorers have usually followed the line of the existing foundations. Perhaps it is in the minor features of mediæval worship, especially the fonts and monumental slabs, that the Anglesey churches will best repay the interest of the English antiquary and ecclesiologist. The church plate may as a rule be neglected, or studied only in the remarkably fine and exhaustive volume entitled "The Church Plate of the Diocese of Bangor," by Mr. Edmund D. Jones.

The first excursion of the Society was taken on Tuesday, the 27th ult., and the party began with two cromlechs. The first, situated on the farm of Bryn Celli du, on the road to Llanidan, is said to have yielded both burnt and unburnt human remains, which led Professor Sayce, who was of the party, to express his opinion that the structure was of the transitional period between the stone age and the early bronze age. The second example stands upon the farm of Bodowyr, and is an excellent specimen of these primitive burial structures. The visitors were here in the very thick of the Druidical region of the sacred isle of Mona, and were unquestionably near to the scene of the exploits of Suetonius Paulinus and the massacre of Agricola. However, the opportunity was not improved for a short and graphic address upon these long-past occurrences, delivered upon the spot, and the party went on without enlightenment. Close at hand also, upon the farm of Caerleb, is a well-preserved camp of distinctly Roman form. On its southern and western sides the interior vallum, ditch, and exterior walls are perfect, and the angles are rounded in true Roman fashion. The northern side is irregular, while the remaining side has only the interior wall. The area within the camp is small, sufficient only for a few men. No inscriptions have been discovered, nor any remains that would suffice to fix its character beyond suspicion. An interesting discussion ensued, Col. W. Ll. Meorgan, R.E., an old officer of the Ordnance Survey, being emphatic in his view of the Roman origin of the small fortification. Mr Edward Owen, who had carefully examined the site a short time previously, while admitting the clear marks of the presence of the Roman legionary, thought the camp itself was primarily not of Roman construction, but rather of Roman adaptation of a previous British station. The position, on low-lying ground, which a couple of thousand years ago was swampy and commanded on all sides by higher ground, would never commend itself to a Roman military engineer for the construction of a fortified post, while, on the other hand, the recorded expeditions of the Romans to the island of Mona being of only a temporary character, it was more likely that the exigencies of the moment would lead to the rapid conversion of an already existing post of defence. It is much to be desired that one or two sections should be driven through the ramparts, and that the entrances, which are remarkably Roman in character, should be scientifically exposed. Excavations were made within the camp about thirty years ago, but with no determinate results. After luncheon at Llanidan House, the deserted church of Llanidan, within the grounds of the modern house, was visited. The ruins now consist of two equal-sized chambers, formerly the nave and north aisle of what must have been a large church for Anglesey. The eastern limb, which also possessed a northern aisle or chapel, is now marked only by an arcade of four openings of the Perpendicular period. Fragments of mouldings are within the building, which also contains a carefully preserved stone reliquary of the XIIIth century. The oldest part of the existing building is the south porch, at the usual angle of which is a stoup, said never to be without water. As is the case at popular meetings like the present, this feature elicited more attention than more important but less evident parts of the early edifice; but when it is said that the saint's well, a feature of great interest which no antiquary should miss, is within a few yards of the church, and that the limestone draining pillar of the stoup penetrates into the soil, a rational explanation of the phenomenon is easily forthcoming.

The carriages next proceeded to a fine camp called Bryngwyn, on the farm of Castell, and within half a mile of the already visited Caerleb. Bryngwyn is a good specimen of the British defensive post formed of an inner inclosure with strong earthen ramparts, and a much larger walled inclosure impinging upon the inner camp at two points. In this instance the latter has almost entirely disappeared, but the course of its defences can be followed on the northern side, where an interment was not long since discovered. No finds made within the camp appear to have been preserved, and it is therefore dangerous to dogmatise as to its builders. It may, however, be suggested that it is of the early iron age. Llangeinwen church, which was next visited, has a most interesting font of much greater antiquity than the edifice to which it belongs, and an incised slab bearing a spiral ornament of early date. Newborough is a creation of Edward I., the wide privileges with which it was endowed by charter indicating that great king's desire to establish a seat of commercial and social influence on the south-western side of the island, to balance his foundation of Beaumaris on the north-western shore, and possibly to counteract the sentimental hold of neighbouring Aberffraw, the home of the Welsh princes, upon the people of the island. The church has been restored, its walls being protected by rough cast, with disastrous results to its picturesque effect. The nave is long and narrow, but the chancel is well proportioned. There is no feature of interest beyond three sepulchral effigies of the XIVth century, which have been well illustrated and described in "Archæologia Cambrensis." Llangaffo church, one of the ancient British dedications to St. Caffo, has undergone severe



Din Lligwy. Co. Anglesey. (*See page 266.*)

restoration. Several incised stones, one bearing a cross originally extending to about one-half the length of the stone, is worthy of careful note by reason of the peculiar termination given to the foot of the cross, which is brought to a sharp point, as though intended to represent a wooden cross shaped for lodgment in the earth. Not far distant, on the road to Berw, stands a tower which is of late XVIth or early XVIIth century, and was probably erected as a watch tower against the piratical descents to which places upon the St. George's Channel were open to so comparatively recent a period. Plas Berw is the only specimen of a mediæval Welsh gentleman's house seen during the meeting, and is one of the very few dwellings of over 200 years old to be found in Anglesey. Its front elevation is unbroken by a projecting doorway or wings, but the tame and flat effect thus produced is modified by the pleasing arrangement of the windows, and by a charming row of dormer openings. Tea was served in the courtyard of the old house, now a garden, by the courtesy and kindness of Lady Reade, the descendant of an important family, the Hollands of Berw, which was itself linked to one of the oldest Welsh stocks.

In the evening the President delivered his inaugural address, and the Society was welcomed to Anglesey by the Llangefni Urban District Council. Sir Richard Bulkeley took as the subject of his address the importance of archæology as a branch of history, and the desirability of the study of local remains in the public schools of the country. Professor Edward Anwyl, M.A., of the University College of Wales, Aberystwyth, next read an abstract of what will prove an important and exhaustive paper upon "The Early Settlers of Anglesey." The lecturer confined himself to the cromlechs of the island, the most of which he thought were of the bronze age, which he regarded as the great period of prehistoric remains in Anglesey. A few were of the transitional period between the bronze age and that of stone, such as the cromlech at Bryn Celli du, which had been seen that day, and a few might ascend into the stone age. He trusted the Association's visit to Anglesey would result in the undertaking of a thoroughly scientific archæological and ethnological survey of the county, such as the Society had undertaken and was now bringing to a conclusion in Pembrokeshire. The Rev. W. Dane Bushell, who has purchased the little island of Caldey, off the coast of Pembrokeshire, for the express purpose of conducting archæological explorations therein, next gave an excellent impromptu address upon the interesting ecclesiastical remains of his island possession. He had been able to work out the ground plan of both an early British monastic settlement and of a later Benedictine foundation. He also put forward the studies of Professor Burkett upon the Caldey inscription, which has been the puzzle and despair of epigraphists. Professor Burkitt believes he reads upon the stone the words "Singno crucis Ihiltuti," which, if correct, would have an important bearing upon our early ecclesiastical history of South Wales, and would bring St. Illtyd, the founder of Llandaff, into connection with Caldey Island.

The business of the second day commenced with an examination of Llanerchymedd church, which proved of no interest. It has a bold and striking western tower of two stages, dating from the late XIVth century. A few of the party were diverted to Trescawen, the residence of Mr. J. Prichard Rayner for the careful examination of an early inscribed stone. As this was the single fresh object to come under the personal examination of the members of the Association, or to have been written upon in "Archæologia Cambrensis," it was felt that special attention should be given to the inscription. Mr Edward Owen first gave an account of what may be termed the re-discovery of the stone. It appears that over a century ago it was lying upon the farm of Tyn'rhosydd, in the distant parish of Llantrisant. Here it was seen by the Rev. John Skinner, a Somersetshire clergyman, who, bitten with the taste for travelling initiated by Pennant and Sir Richard Colt Hoare, visited Anglesey in the year 1802. Mr Skinner kept voluminous notebooks of his various tours, one of which he devoted to Anglesey, and in this he recorded as much of the inscription as he could read. His notebooks he left to a relative, who in turn bequeathed them to the British Museum, on the condition that fifty years should elapse before they were made available to the public. This period expired about ten years ago, when Mr. Owen at once fell upon the Anglesey volume. Mr. Skinner's account of the stone, which by this time had disappeared from the spot where that gentleman had discovered it, was communicated by Mr. Owen to several local gentlemen, and eventually it was traced to the modern mansion of Trescawen, where it had been removed by an ancestor of the present owner. The hundred years of weathering to which it has been subjected since Mr. Skinner's time has played sad havoc with the inscription, and it is now difficult to do more than decipher the few concluding words. The scientists came to the conclusion that the stone was not Roman, but, on the other hand, the letters were of an extremely early period, and probably erected in memory of a Cymric chieftain either immediately before or directly after the withdrawal of the Roman legionaries. It is, therefore, the earliest inscription of the post-Roman inscription in the kingdom, and its length makes it the most important memorial of the Romano-British period. The party united at Llanfihangel tre'r beirdd, the church of the township of the bards, which has undergone a drastic restoration. It should be mentioned to the credit of the modern restorers that whenever during the course of operations features of interest have been disclosed, care has usually been taken to preserve the remains. An example is here found in an inscribed stone, now fixed in the north wall close to the north doorway. It is no more than a fragment, and the characters are so faint that it is even doubtful if they be letters. The writer of this notice is inclined to regard them as "Or + do," pray for the soul of, the personal name being wanting. If this conjecture proves to be correct, the stone is unique in Wales, in bearing the Irish sepulchral formula. Parcian, the residence of Major Lawrence Williams, has a fine camp, spoken of as Roman, but much more likely to be Romano-British, and of the same character as the camp at Castell seen on the preceding day. An early XVIIth century dovecot, erected by the Royalist Sir John Bodvel, is interesting. Llaneugrad church is of late XIVth or early XVth century. A round-headed arch divides the nave from the chancel, and a northern chapel is in line with the eastern wall. This chapel roof has oaken principals of good though rude work. Tradition has it that owing to a feud a neighbouring squire would not enter the church by the same door as his opponent, but that he built the peculiar northern limb with a separate doorway.

Next came a drive to Llugwy, the residence of Lord Boston, where excavations had been conducted by Mr. E. Neil Baynes, a near relative to Lord Boston. Upon the verge of a steep slope and on a small plateau overlooking a small bay is a camp possessing certain features which differentiate it from the general run of Goidelic or Brythonic defensive posts. Din Lligwy, as it is called (the plan is given on page 265), is a pentagon, of the area of about half an acre. The exterior walls are formed of two parallel rows of enormous limestone slabs placed upon end, and measuring about 10 ft. in thickness, the space between the rows of limestone being filled with dry rubble. The height of the walling was probably from 5 ft. to 6 ft. Within this practically impregnable defence were two circular dwellings and four rectangular chambers, the walls of which were of the same character as the external walling. The excavations conducted by Mr. Baynes have been carried out with the greatest care and thoroughness, but it is somewhat surprising to find that the finds should have been disappointing both in number and in character. They include fragments of coarse, reddish pottery, black Romano-British pottery, a few fragments of pseudo-Samian ware and of Roman glass, small ingots of silver and lead, and thin sheet bronze, a quantity of bones, and six or seven Roman coins of the lower empire. In Mr. Baynes's opinion the original dwellings were Goidelic, the two circular dwellings being remains of the primitive settlement. The inclosure as it now stands dated, he thought, from Romano-British times, and may have been an outlying position to the larger village of Parcian. If it was actually occupied or controlled by the Romans, the latest coin found pointed to its evacuation having taken place at the end of the fourth century. Mr. Baynes's excellent paper was distinguished by admirable clearness and scientific insight, and was listened to with the closest attention. It will appear in due course in the "Archæologia Cambrensis." Sir Henry Howorth opened the discussion. He heartily commended the thorough manner in which the excavations had been conducted, and concurred generally with Mr. Baynes as to its Romano-British origin. He was, however, disinclined to accept any suggestion of Irish influence, as the finds did not display a trace of the characteristic forms of early Irish art. Professor Sayce considered the site was that of an early mining camp, the finds of slag showing that the people who dwelt there were engaged in the smelting of metals. Professor Anwyl and Colonel Morgan also spoke. The writer of the present notice has, by the kindness of Lord Boston and Mr. Neil Baynes, had the opportunity of more carefully considering the Llugwy remains than is possible on the visit of a large party. He agrees with Sir Henry Howorth that the absence of the objects known as late Celtic renders it difficult to connect it with Goidelic settlers. It may also be pointed out that square inclosures are never found in distinctly Celtic camps. The present writer is disposed to regard this as Danish in origin. The site is an ideal one for the settlement of a body of sea rovers, and the number of Scandinavian names from the Wirral peninsula to St. David's Head prove the presence of Norse settlements on the seaboard of Wales. After the addresses, tea was partaken of. The visitors next stopped at the Penrhos Llugwy cromlech, celebrated for the immense size of its capstone. The final halt was called at Penrhos Llugwy church, which has a well-known slab bearing the inscription "Hic Jacet Maccu Deccetti."

INVESTIGATIONS OF STRUCTURAL MATERIALS BY THE UNITED STATES GEOLOGICAL SURVEY.

THE following article has been forwarded to us by the Editor of the Technological Branch of United States Geological Survey. It is written by Mr. Richard L. Humphrey, the Engineer in charge of the Structural Materials Division. It is a very interesting account, which we are glad to publish; only noting the fact, first, that it is supplied by the Geological Survey, and is their own account of their own operations, not an independent article.

With the problems arising from the growing scarcity and consequent increase in the price of wood, principally lumber used in building construction, the search for a desirable substitute becomes a matter of prime importance, and justifies the work now being done by the United States Geological Survey at its structural materials testing laboratories at St. Louis.

The increased use of concrete in many forms during the past few years, especially for building purposes, has created a great demand for information regarding the structural value of this material. For a number of years limited investigations designed to obtain this information has been carried on by a number of investigators throughout the country, but no serious attempt at co-operation in this work had been made until a few years ago, when the United States Geological Survey, recognising the need of information and co-operation, procured a small appropriation for making tests of structural material, and invited various technical societies to take part in the work.

A committee, called the Joint Committee on Concrete and Reinforced Concrete, was invited to assist in outlining the work at the laboratories. This committee is composed of members of the American Society of Civil Engineers, the American Society for Testing Materials, the American Railway Engineering and Maintenance of Way Association, and the Association of American Portland Cement Manufacturers. The leading professors of engineering from almost all of the large colleges in the country are members of this committee, and they exercise general supervision over the work.

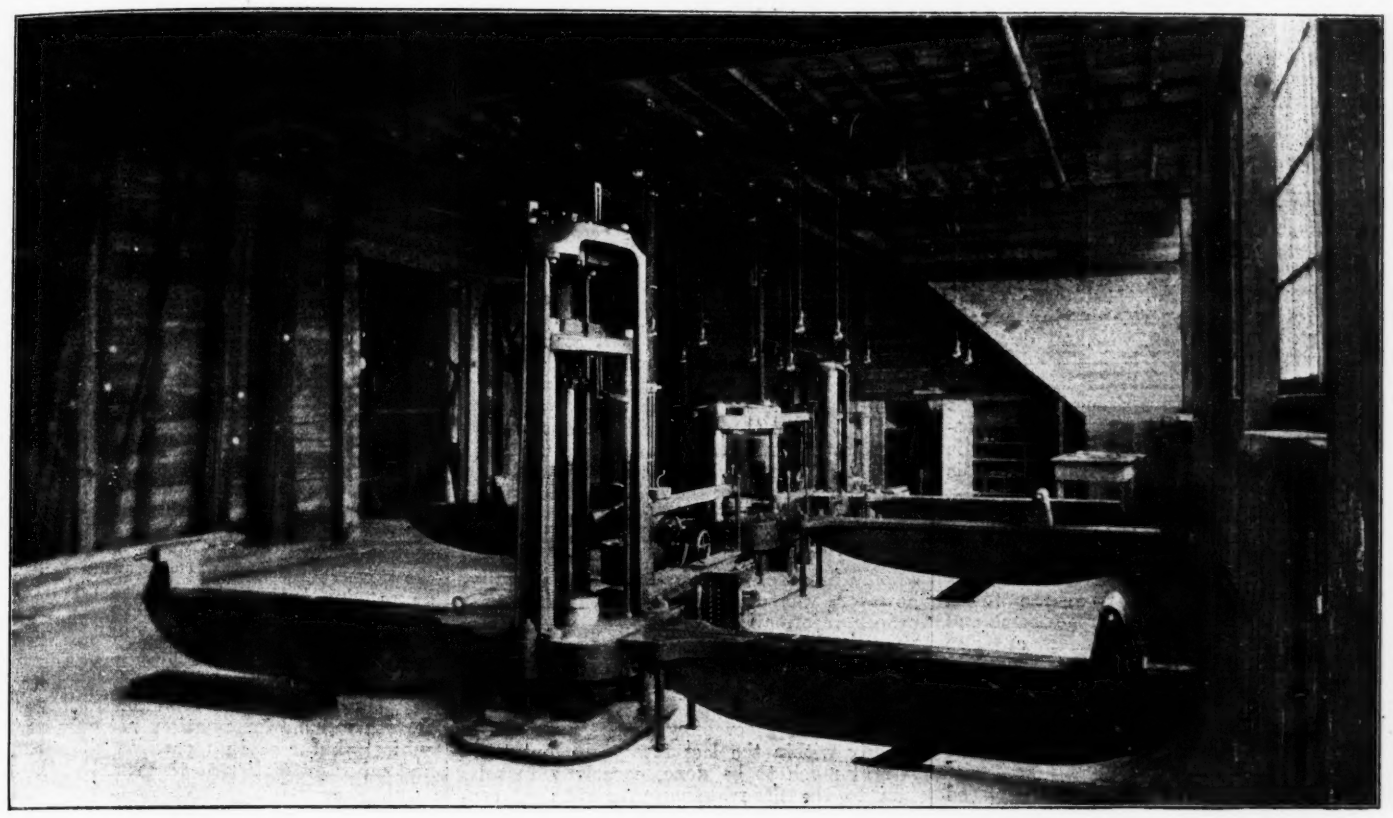


Fig. 1. Three Concrete-beam Testing Machines.

An advisory board composed of leading engineers throughout the country was at once created, and has had general supervision of the work.

Tests are being carried on to determine the value of different sands, stones, and other materials used in the manufacture of concrete. The material is shipped from all parts of the country by geologists connected with the work, and a complete record of the material is sent in by them. At the laboratories this material is made into mortar and concrete by using the different percentages ordinarily employed in practical work and following as closely as possible practical conditions.

In addition to the study of the constituent materials of mortars and concretes, structures of various kinds similar to those used in buildings are made and tested.

The equipment of the laboratories at St. Louis for carrying on this work is very complete. In addition to all needed smaller apparatus, there are four testing machines of 200,000 lb. capacity and one of 100,000 lb. capacity, suitable for testing beams and other structures used in buildings. These machines will test beams up to 20 ft. in length, and are equipped to make tests of the different materials used in construction work. Three of these machines used in the beam division are shown in Fig. 1.

In addition to the above machines, a very large machine, having a working capacity of 600,000 lb., will, in a few weeks, be installed at the laboratories at St. Louis. As far as known at this time, there is only one other machine in the United States similar to this. This machine will make it possible to test columns, beams, and, in fact, all the different kinds of construction material now used. It will test very large reinforced concrete girders up to spans 30 ft. in length, and concrete columns up to 30 ft. in length.

The value of such tests as these is readily apparent, since their results can be applied directly to practical work. A very serious objection to the use of results obtained in tests made by private investigators is due to the fact that the tests were applied only to small specimens not nearly approaching in size the parts or pieces used in actual construction. Heretofore it has been necessary to consult the results of these small tests in order to have some basis for design, but it is now clearly recognised that the best results can be obtained only from tests made on members as large as possible, or, at least, on pieces as large as those ordinarily used in structural work.

All the concrete used at the laboratories is mixed in three Chicago cube concrete mixers, each of which is mounted on skids, geared to a motor, and equipped with charging hopper. One of these mixers has a capacity of 1 cubic yd., and the others will contain $\frac{1}{2}$ cubic yd. each. After the concrete is mixed it is carefully tamped in moulds to form the different pieces on which the tests are made, such as cylinders, cubes, and beams.

The laboratory also uses five hollow concrete block machines, used for making concrete blocks similar to those used in actual construction, and the several different divisions—the constituent materials division, the beam division, the concrete block division, the permeability, the sheer and tension, and the chemical division—are equipped with all apparatus necessary for conducting their tests.

Although reinforced concrete is used to a remarkable extent at the present time, and both concrete and reinforced concrete construction is becoming more and more popular every day, it is evident to anyone familiar with construction work that these materials will be more generally employed within the next few years. Many engineers are prejudiced against the use of concrete and reinforced concrete, but this prejudice is rapidly being removed by the obtainment and publication of reliable data regarding this material. Without doubt, in a very few years, when most of the principles underlying the use of concrete and reinforced concrete have been fully established from tests and investigations, there will be little prejudice against the use of concrete, the present prejudice evidently being due to lack of information.

The longest beam thus far tested in the beam division has been 13 ft. in length. Beams of this length tested are made without steel, that is, of solid concrete beams, and also with varying proportions of steel, ranging from very small percentages up to 3 per cent. The load is applied at the top of the beam at points 4 ft. from each end. The men conducting the tests watch the beam very closely while it is in the testing machine, and examine its surfaces with magnifying glasses in order to locate the fine cracks as they appear. In the beginning a load of about 5,000 lb. is applied, and the machine is stopped with this load on the beam. After the observers have examined the beam carefully and made a record of the cracks appearing at that time, the load is increased, and after every 1,000 lb. additional the beam is again examined until the maximum load is applied.

In a very large number of tests the beam shows no cracks that are visible to the eye until the maximum load is reached, when the steel reaches its elastic limit, and begins to stretch fast, this result ending the test. The cracks that appeared on the beam and the loads at which these cracks appeared are recorded by photographs.

In beginning tests of reinforced concrete simple round rods were used, as it was thought that more uniform results could thus be had than if any of the patented systems were used. After a complete series of tests with the round rods has been made, it is proposed to take up tests of the different forms of bars that are used in practical work, and the results will be published from time to time by the Geological Survey. Tests will be made of beams ranging from 6 ft. to 12 ft. in length, and because of longer span will be tested later, if necessary, in order to get results that can be applied to almost all practical conditions.

The concrete used in the different beams tested, as described above, is moulded into cylinders and cubes, which are tested in order to get the direct strength of the concrete. These cylinders and cubes are all tested at different ages, generally at ages of seven, twenty-eight, ninety, 180, and 360 days. The cement, sand, stone, gravel, or other material composing the concrete is carefully proportioned by weight, the correct percentage of water is used, and the whole mass is placed in a mixer and thoroughly mixed. It is then deposited very carefully in moulds or forms which, after twenty-four hours, are removed. The concrete is then moved into a storage-room, and is there sprinkled with water three times each day. Each test piece is numbered on a card index, which tells where information relating to the test pieces can be found, and also indicates the dates on which the different pieces are to be tested.

A branch of the work that should be of interest to everybody, especially the small house-builder, is the investigation of cement building blocks. Many houses are now built of cement blocks in preference to wood, because generally cement-block construction is cheaper and better than wood, since it is fireproof, more durable, and less expensive to maintain. The exterior surfaces of wooden buildings must be painted, and clapboards must be added from time to time; but when the cement-block building is finished, the surface is there once for all;

no further treatment, no repairs, no maintenance are necessary.

All the cement blocks used in these investigations are mixed in concrete-block machines. The concrete is mixed in a ½ cubic yd. cubical concrete mixer and deposited on the floor of the testing-room. It is then shoveled into the hollow block machines and compacted very firmly in the forms. Varying proportions of concrete, sand, and stone are used in order to determine the relative value and economy of using different mixtures. Some blocks are made of wet concrete, others of concrete very dry, and still others of concrete having a consistency medium between wet and dry. In actual practice, concrete blocks made from comparatively dry concrete is usually preferred by the manufacturers, for these blocks harden quickly, and the forms may be removed almost as soon as all the concrete is placed in the machine. By this practice it is possible to use the same machine for making a large number of blocks each day, whereas when wet concrete is used, the blocks must remain in the machine for a much longer time before they can be removed. When the concrete blocks are removed from the forms they are placed in the storage-room and tested at different ages. Cylinders are also made from the same concrete that is used in the blocks, and the results of tests of the cylinders and of the blocks establishes a relation between the strength of the concrete in the cylinder and that of the concrete in the block.

When the blocks and cylinders are placed in the storage-room, each test piece is numbered, and its number is filed away on a card in a card index. Each card bears the date on which the test piece is to be tested, and the cards are filed in chronological order. This brings the current date at the front of the drawer each morning, when cards bearing the same date are taken out and the pieces are taken from the storage-room and tested. The results are compiled on forms, and later published in reports issued by the Geological Survey.

Concrete blocks are tested at the laboratories in two different ways; first, as shown in Fig. 2, to see how much of a centre load each block will stand. Although blocks are not actually subjected to a load of this kind in practice, the results of this test make it possible to compare the relative values of different building blocks. Second, after the block has been broken at the centre by this load, each half is placed in the testing machine and crushed, in order to find the crushing strength of the block. The results of this crushing test show how much pressure similar cement blocks will stand when used in actual building construction.

The results of the great fires at San Francisco and at Baltimore demonstrated very clearly the fact that modern buildings are not so nearly fireproof as they should be, and as they can be made. The lack of fireproofing in the past has been due somewhat to the reluctance of owners to add a small percentage to the cost of their buildings by properly fireproofing them. The failure to employ fireproof construction more generally, however, was due in part to the fact that proper information was lacking, and many engineers, architects, and owners who tried to make their buildings fireproof used all the information at their command at the time of building.

The art of fireproofing has been developed rapidly within the last few years, but there is still much to be done, especially in relation to the fire-resisting properties of concrete. In order to obtain information to meet these needs a series of fire tests are being carried on by the Geological Survey at the Fire Underwriters' Laboratory at Chicago.

For this purpose a hanging door having a steel frame and a 1-ft. wall of firebrick inside of it is used. At the centre of this frame there is an arched opening of about the size of an ordinary door. For the fire tests this opening is built up successively with different materials—ordinary building brick, firebrick, hollow tile blocks, the different kinds of cement building blocks, stone, concrete, and terra-cotta. After the opening is filled, a flaming gas jet is played all over the door for a long time, and when the heated surface is very hot the gas is turned off and the door allowed to cool. In some tests the cooling takes place slowly, in others a stream of water is played on the door immediately after the gas is turned off in order to reproduce as nearly as possible the actual conditions in a fire.

When these tests are completed, the results will not only show engineers and architects what material is best for fireproofing, and how much should be used to procure the best results, but will also teach the small builder, the builder of a home, what kind of a cement block is best adapted to make his house fireproof.

It is the consensus of opinion among engineers that a reasonably fireproof building can be constructed, and it is hoped that the art of fireproofing will be so developed in the next few years that the public will also be convinced that this is true. It is also desirable that the public should be thoroughly informed as to the fire-resisting qualities of the various classes of building materials, and it is expected that the work being done by the United States Geological Survey will furnish reliable information, not only on this subject, but also in regard to the strength and other properties of these materials.

ROMAN CATHOLIC ELEMENTARY SCHOOL, HIGHGATE.—On the 31st ult. Archbishop Bourne visited St. Joseph's Retreat, Highgate-hill, and laid the corner-stone of a new elementary school now in course of erection by the congregation of St. Joseph's. The cost, including improvements to the old school building, will be 4,000*l*. Mr. R. L. Curtis, architect, prepared the plans for the work.

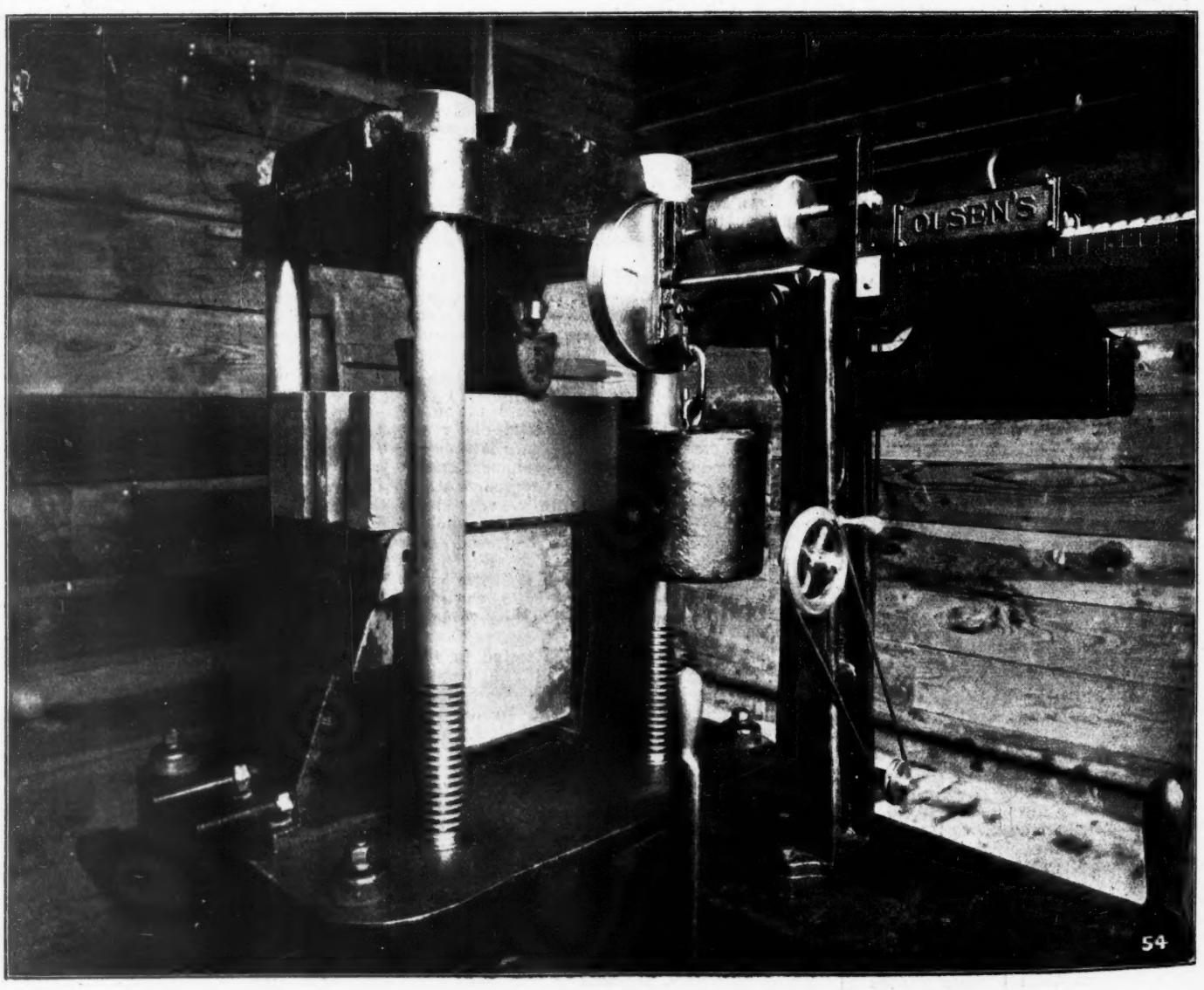
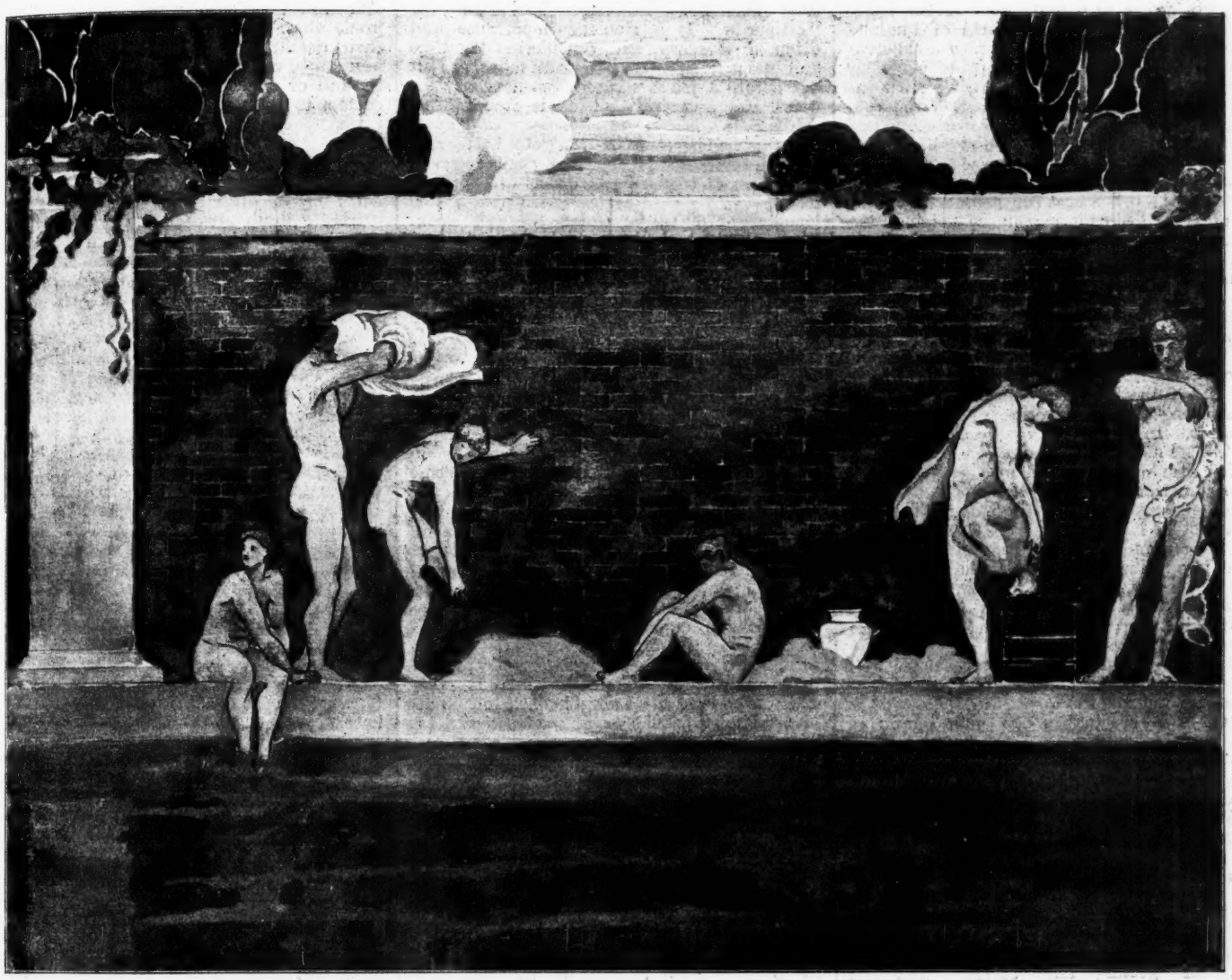


Fig. 2. Testing Concrete Blocks.



Sketch for Mosaic Frieze for Turkish Baths. Fredk. Harrison Mayo.

MOSAIC FRIEZE FOR TURKISH BATHS.

THIS is a reproduction from a very pleasing little coloured drawing of a decorative frieze for Turkish Baths, by Mr. F. Harrison Mayo, which was exhibited at the Royal Academy.

The colour shows the nude figures, treated (as they should be) in a rather flat conventional manner, relieved against a red brick wall, the sky and trees showing above.

As we observed when noticing the drawing at the Academy, it may be questioned whether it is altogether suitable to oppose, as a bath decoration, conventionalised nude figures to the actual figures which would be seen there at the same time. But in itself, apart from this consideration, it is a good piece of decorative design.

Builders' and Contractors' Column.

NOTES ON ESTIMATING.

By A. C. Passmore.

THE literature on the subjects of quantity surveying and estimating is at present very vague. Many of the instructions given in books do not go sufficiently into detail, and none of them can claim to be complete or entirely reliable, being for the most part wanting in system, or taking it for granted that the student has had large experience or minute knowledge of the different trades and methods which often take a lifetime to acquire. To the novice, estimating seems a comparatively easy subject when the published price-books are so easily obtainable, but the practical estimator does not take these books seriously. They are, of course, a handy compilation of information connected with the building trade, but no standard compilation of prices is applicable to any or every job, as methods, prices, and subjects appertaining to the building trade are constantly fluctuating. Conditions vary considerably on every job, and many things will affect the balance between profit and loss, such as weather, fluctuations in prices of material, lack of proper supervision, hampering by the architect and clerk of works, delay in furnishing details, dearth of suitable labour, delay in merchants sending materials, different localities and sites.

From the foregoing it is obvious that a price-book of standard prices suitable for every job is impracticable. In quantity surveying a "standard" of methods and practices is far more practicable, as standard methods of measuring can be applied to every item. Experience, and experience alone, is the best teacher; and although there are many books published for the use of the trade, they are of little use to the builder or estimator when competing for work. The prices given in books are generally considerably above the prices obtainable in competition, and they are by no means consistent; and it may be taken as a maxim that when an estimator knows enough of his business to know when he can trust a price-book and when not, he has become competent to dispense with it altogether. The best price-book is the book that the estimator should compile for himself from actual work executed. All labours, whether great or small, should be noted in a book for future reference. This will provide him with valuable data far more useful to him than information gained from any other source, as it will be the result of his own experience. Still the novice in his earlier efforts can by no means afford to ignore the published literature of the subjects, and, used with discretion, will find them a great help so long as he does not trust to them blindly, as estimating calls for great care and forethought. In the erection of every building many contingencies must arise which should be forseen and provided for, or adjusted as the work proceeds. Men well versed in construction can carry out the erection of a building more economically and effectually than those who have to stop to consider every little point of detail. Those who possess the faculty of seeing the work in front of them can provide the different materials required at the proper time and in their proper quantities, can take advantage of the waste of time that often occurs through being unable to proceed by the men having to wait for materials.

It may safely be said that the majority of estimates are prepared in a somewhat haphazard manner, and without a full knowledge of the analysis of the subject. No book on estimating can be more than an introduction to the principles upon which the subject is based; it cannot possibly set forth standard rates, as rates (or prices) vary according to circumstances and locality, and the constant fluctuations of the market and the time of the year. A job that has to be executed in the winter should be priced at a higher rate than one to be executed in the spring or summer, and a rainy period is often as disastrous to a builder as frost or snow, whilst in some districts the absence of rain is often a drawback where water has to be found for use of works. To the novice at estimating price-books are his first resort and often his downfall.

The modern estimator approaches his work in a more methodical manner than his predecessor who generally "lumped" his quantities and "jumped" at his prices, and although this method is still adopted it is generally realised that a clear and exact method of measuration and valuation pays in the end, even if it may appear pedantic. In pricing bills of quantities a good plan is to show the analysis of each item in the margin or on the back of the preceding page, not only for future reference, but to enable any person checking the prices to see how they have been arrived at; it also keeps an estimator closer in touch with his prices. In London and the South of England it is usual to employ a single contractor to execute the work, whereas in the provinces the chief contractor frequently employs

sub-contractors to execute part of the work. In the Midlands and the North of England it is a frequent practice to employ a different contractor for each trade. It is generally admitted that the economy arising from the use of machinery has not benefited the contractor so much as it has the workman, and the former knows how severe are his efforts to get work in order to keep expensive machinery going; in fact, it is often a case of how near prime cost can he afford to work in order to keep his machinery going; however, such a method of doing business is not commendable, and anyone who gives a cost-price quotation for any work inflicts a gross injustice on himself and on the other competitors, who are put to considerable expense in preparing their estimates.

The essentials of an estimator may be briefly said to be accuracy and knowledge to the fullest extent of their meaning. Estimating calls for great care and forethought. In the course of erection of every building many contingencies must arise which should be foreseen and provided for. The practical estimator should possess a sound and intimate knowledge of the methods and cost of labour of every item, local rates of wages, and current prices of materials. The two principal factors may be said to be :—

(1) The cost of the material.

(2) The cost of the labour in fixing or using the material.

It is not difficult to ascertain the cost of the former, as it may be computed to a fraction; but the same cannot be said of the latter, and therein lies the chief reason of the vast difference in tenders, and if a mistake occurs it will probably be found in the labour side of the estimate, and the question arises: Has the labour been estimated too low, or has the labour cost more than it should?

The other factors are :—

(1) Plant necessary for the execution of the work.

(2) Cartage or hauling.

(3) The local supply of labour.

(4) The site, its surroundings, and facilities for getting and storing materials upon it.

(5) Specialities specified.

(6) Ability of building owner to pay, and modes of payment (a liberal method of payment enables a job to be executed cheaper and with more dispatch).

(7) Terms of agreement.

(8) Time clause.

(9) Maintenance clause.

(10) Prime cost items.

(11) Provisional sums.

(12) Strikes, with changes in the price, efficiency, and conditions of labour.

(13) Alterations in the prices of material.

(14) Accidents and liability under the different Acts.

(15) Arbitration clauses.

(16) Accuracy of quantities.

(17) Practicability of plans.

(18) Work which must be done to "detail."

It is well known that the cost of ordinary building work has risen considerably within recent years on account of the increased prices of labour and material. The actual cost of a building or work under present conditions is no criterion of its true value, and the great difference in estimates may be said to be due to :—

(1) Under-estimating.

(2) The difference of opinion as to what is a "fair" profit.

Frequently the estimator under-estimates the difficulties or probable cost of executing the work, or it may be a case of "get it at any price" to keep the pot boiling, so that the work may be executed at a most absurd and unreasonably low unit of cost, or much below its cost-price; and as price practically governs every contract, it is hard to conceive what benefit is gained by doing work at cost-price. In estimating it should be an axiom that a contract is not worth having unless a fair price can be obtained, as, generally, something happens to swallow or diminish the estimated profit. The time occupied in estimating is a most serious item in the office expense of a builder's business. The small builder usually does most of the pricing himself, or fixes the rates to the different items and leaves the carrying out or totalling to his clerk, and merely checks the total amounts. In large businesses the "estimator" is a man of importance and often large salary, and, considering the time and number of estimates that must be got out before a job is secured, the necessity for quick and accurate methods is obvious. In estimating it is imperative to know thoroughly the class of work to be carried out and the actual cost of similar work, formation of the site and means of access to it. A casual glance at the plans give a fair knowledge of the character of the work, levels, depths of footings, etc., the specification giving particulars of the quality of materials and character of workmanship, and the quantities give the quantity of materials and labour required. It is fallacious for an estimator (if he is an ex-tradesman) to base his prices on his own ability or labour, or upon the labour or ability of any particular man, as the average workman may not do one-half of the work of specially selected men, but a builder having a good staff of reliable men can generally execute work more cheaply than another who has to engage casual labour.

A practical estimator should compile notes of the different strata he meets with in various districts. In some districts, such as for example, on the banks of the Thames at Woolwich, Plumstead Marshes, Belvedere, etc., water quickly accumulates in the trenches and cesspools, causing foundations to be a very speculative item. In some neighbourhoods gravel may be perhaps met with 3 ft. below the surface, whilst in other districts it may not be reached within 30 ft. If trial-holes have been dug on the site (as is frequently done for the architect in determining his foundation) and they have not been filled in, they will give an estimator some idea as to the nature of the site.

An estimator will quickly find that it is indispensable to have a large collection of price-lists and trade catalogues with their trade discounts. They should be frequently brought up to date; for easy and quick reference a good plan is to hang them on nails in a cupboard or around the walls of the office; some kind of order must be kept by keeping those relating to different subjects separate, or they will become more nuisance than use. Generally speaking, the practice of obtaining quotations before a contract is actually secured is not of much use, as merchants are more likely to give lowest quotations when they know that the order can be placed with them. Of course, in some cases it is absolutely necessary in the case of specialities to obtain quotations before sending in estimates.

An estimate may be said to be made up of three things—material, labour, and profit. The labour item is perhaps the most difficult to estimate, as, although trade unions have insisted upon a uniform rate of wages, they have not insisted upon a uniform output or production, and good or bad workmen form the vital factor upon which rest the finances of every job. An estimator who is estimating for work in different localities should compile a list of the average current rates of wages for workmen, as, although it is economical and desirable that foremen and leading hands should be selected from a builder's staff, for country jobs the bulk of the men will have to be obtained locally.

The novice at estimating is advised to keep his prices high until he has "felt his market," or, in other words, until he sees the position of his estimate in the list of tenders. He must then use his judgment as to the percentage he must deduct in order to obtain a fair profit, and yet secure the work. Profit generally resolves itself into what can be got, or whether a man is working with his own or borrowed capital; if with the latter it is obvious that his percentage of profit should be greater in order to meet the interest on his borrowed capital. Generally speaking, the size of the job regulates the ratio of profit estimated for, usually 5 to 10 per cent. (according to the size of job), exclusive of working expenses, is considered a fair profit, although in some cases 2½ per cent. would yield a fair return, whilst in very small jobs, and especially alterations, 15 to 25 per cent. would have to be allowed to show a fair profit. It requires a large experience and a comprehensive grasp of the subject before the ratio of profit can be definitely fixed in making out an estimate, as the ratio is not always uniform; some classes of work yield a greater proportion of profit than others. Some estimators price their quantities at prime-cost and add the percentage of profit in one sum at the end of the bill or summary, but it is generally the custom to add the profit to each individual price.

The practice of pricing quantities "net," that is, adding the required percentage of profit at the end of the bill in one sum, or pricing them "gross," that is, placing a profit on each item separately, has advantages and disadvantages whichever method is adopted. By pricing them "net," and leaving all consideration of the profit to be allowed until the total has been arrived at, leaves the estimator more free to deal with questions of fact, and not hampering himself by debating as to whether it is to be a "cut" or a "fat" job. It is desirable in many ways that no fixed rate of profit should be arrived at until the prime cost is known, as, having ascertained as nearly as possible what the approximate prime cost will be, and using this as a basis of fact, the builder knows his position exactly when he decides the amount of his tender. It also gives a hard-and-fast limit of cost of every item that must not be exceeded, and is a better guide to the person in charge of the work than if the quantities are priced "gross." Where quantities are priced "gross" an estimator never exactly knows his position, as almost invariably something is added or deducted at the last moment without any accurate basis. It is considered a fair average if one tender in twenty is the lowest, but a keen estimator may reduce this average to a great extent.

Above all things, an estimator should be consisten in his prices, and use his old estimates to form parallel cases to save his labour and to check himself in forming approximate estimates; but it is essential that all estimates be based on recent data and current prices as far as possible, as the unit of cost has considerably advanced of late years. When estimating it is essential to read the headings of each bill, as, although they only generally relate to the description of materials, they often contain items or descriptions which require pricing, or which affect the prices or measurement of the items referred to. Old estimates should always be kept and put away, whether the work is secured or not, as they will be found of the greatest value for future reference. If the work is secured, a correct account of the prime cost of each item and all labour should be made opposite each item, so that the bill of quantities becomes really a source of reference. The various markets should be closely watched, and when a contract is secured, if the markets are low the orders for the whole of the materials should be placed in order to take advantage of it, whereas if the market is high discretion should be used in placing orders, as the market may drop at any moment and the advantage be lost.

Illustrations.

SCULPTURE: "LE RÊVE DU POÉTE."

THIS work, though it is not intended to be specially erected anywhere as a monument to Alfred de Musset, has of course reference to him, and, like the monument in the Rue de Rivoli (illustrated last year in our pages), is suggested by his beautiful poem "Nuit de Mai."

The attempt to combine a portrait of the poet in modern costume with ideal figures, draped and undraped, is of course open to criticism; but apart from that objection it is a fine and poetic work. It occupied a prominent position at the last Salon, near the main staircase leading up to the picture galleries. M. Alphonse Moncel is the sculptor.

The work has been executed in marble as a joint commission from the Government and the Paris Municipality, who have shared the cost. It is probable that it will be ultimately set up, amid some kind of architectural framing, on a site behind the Grand Palais, on the portion of the Champs Elysées known as the "Cours la Reine."

PORTION OF NAVE OF CATHEDRAL CHURCH.

THE plate here given was a portion of a design for a cathedral church, submitted in the Liverpool preliminary competition and exhibited in this year's Royal Academy.

It is, of course, not Liverpool Cathedral, but the idea was to show what the designer thought suitable for the great church of that town, graced by such buildings as St. George's Hall and the Walker Art Gallery, and as he then thought in close proximity to both, where a Gothic edifice would be obviously out of place. It was the endeavour to use a free treatment of detail, following as far as might be the feeling of the Jacobean and Francis I. periods, and giving as much scope as possible, to sculpture, painting, and coloured decoration in general.

The design itself was very fully described, in the *Builder* notes on the exhibition, and requires no further comment beyond saying that it is not, as there suggested, a new drawing, but was submitted with other sketches in the competition named.

W. H. JEWITT.

POLESDEN LACEY, SURREY.

POLESDEN LACEY, which is situated near Great Bookham, in Surrey, within easy reach of Leatherhead and Dorking, was built during the years 1903-5 for the late Sir Clinton Dawkins, K.C.B., who, though he was able to inhabit the house, most unhappily, died before the work was really completed.

The house is finely situated at the height of about 400 ft., looking south over a valley, and facing Ranmore Common, while Boxhill is visible across the end of the valley to the east.

It occupies the site of an older and uninteresting house, which was pulled down to make place for it, with the exception of a small portion of the south front, including the dining-room (originally two rooms), boudoir, and part of the morning-room, together with the portico shown in the south elevation. This portico is interesting as reproducing the order of the now destroyed Ionic temple on the Glissons.

Like the old house, the new is of brick covered with yellowish stucco; in the new building the window frames and dressings—which are of cement—are painted white, and the roof is covered with green Westmorland slates. The two wings, marked "library" and "orangery," were not carried out before the death of the original owner, though everything was arranged so that they might be added subsequently, and the library wing is now being built and the interior of the house in part remodelled by another firm of architects for the new owners.

The builders' work was carried out by Messrs. Colls & Sons, the Dorking branch of Messrs. Trollope & Colls' firm, with Mr. Challacomb as manager, and Mr. Spicer as foreman.

The external sculpture and some internal modelling was carried out by Mr. J. H. Robbins.

Besides the dwelling-house, an engine-house, well-house, water-tower, and stables were built; the engineering portion of the work was designed and supervised, in conjunction with the architect, by Mr. S. N. Terry, M.Inst.C.E.

AMBROSE POYNTER.

POYNDERS END, HERTS.

THIS is a house of which Mr. Geoffrey Lucas is the architect; the drawing was exhibited at the Royal Academy this year.

Mr. Lucas promised us a description of the building, which, however, has not been sent. A small plan of the house is given on the drawing.

HOLYROOD CHAPEL.

THE Council of the Edinburgh Architectural Association, on February 18 last, appointed a Special Committee to report on the following points in regard to Holyrood Chapel:—

"1. What remains of the structure exist.
2. The condition and capabilities of the parts remaining.
3. Whether the evidence of these parts is sufficient to enable a satisfactory repair and restoration of the structure to be made."

The Special Committee consisted of:—Messrs. G. S. Aitken, T. Arnold, F.R.I.B.A., J. T. Baillie, Hippolyte J. Blanc, R.S.A., F.R.I.B.A., F. W. Deas, Henry F. Kerr, A.R.I.B.A., David Robertson, A.R.S.A., F.R.I.B.A., H. O. Tarbolton, F.R.I.B.A., and John Watson, F.R.I.B.A. Nine meetings of the Committee were held, three of which (each of several hours' duration) were at the chapel. Many independent visits, also, were made by the members of Committee. The following is their conclusion as to clauses 2 and 3:—

"The Walls and Piers (so far as your Committee were permitted to examine them) are well built with rubble core, and ashlar or cube stone facing. The stone appears to have been carefully selected, and is, with the exception of some surface wasting, in good condition.

Where it was possible to examine the mortar in the Walls, it appeared to be sound.

The Walls are not all vertical, but, with the exception of the South Wall of the Main Arcade, they are so slightly off the perpendicular that their stability is not affected.

The South Wall, embracing the Main Arcade and Triforium—42 ft. in height—bulges inward on plan from each end, and overhangs in vertical section about 14 in. into the Nave (near the centre of its length). The thickness of this wall averages 4 ft. 3 in. Your Committee believe that this wall is able to support the Clearstory, the Stone Vault, and the Timber Roof needed to complete the building.

If, on a more thorough inspection than your Committee were permitted to make, any parts of the Structure were found to be seriously faulty, those parts might be reconstructed without affecting the fabric.

3. Upon the third point of the Remit, your Committee have no hesitation in saying that from the evidence of the parts remaining there is sufficient to enable a satisfactory structural repair and restoration to be made; but they express no opinion on the historic or æsthetic aspect of the question, as such does not fall under the Remit."

Architectural Societies.

ARCHITECTURAL ASSOCIATION.—The following is the list of papers promised for the ensuing session of the Association:—

1907.

Oct. 4. Annual General Meeting. President's Address and Distribution of Prizes.
Walter Cave, F.R.I.B.A.

„ 18. Sentiment in Architecture.
Halsey Ricardo.

Nov. 1. Travelling Studies.
Professor W. R. Lethaby.

„ 15. The Relations between the Architect and the Builder.
James S. Gibson, F.R.I.B.A.

„ 21. Conversazione at 8 p.m.

Dec. 6. Laying out London.
Paul Waterhouse, F.R.I.B.A.

„ 20. Wren City Churches.
Arthur Keen, F.R.I.B.A.

1908.

Jan. 10. The Kingston Earthquake and Building in Jamaica.
Sir Chas. A. Nicholson, Bart.

„ 24. Stained Glass.
J. Dudley Forsyth.

Feb. 7. Garages and Motor Houses.
C. Harrison Townsend, F.R.I.B.A.

„ 21. Oxford.
Edward Warren, F.R.I.B.A.

Mar. 6. Water Colour Drawing for Architects.
P. L. Forbes.

„ 20. Some Notes on Domestic Work of the Renaissance in England.
Henry Tanner, Junr., F.R.I.B.A.

April 3. Originality and Tradition in Design.
Lewis F. Day.
NOMINATION OF OFFICERS.

„ 9. Members' Dinner.

May 1. Comparison of the London County Hall Designs.
ELECTION OF OFFICERS.

The meetings are held at the premises of the Association at 18, Tufton-street, Westminster, at the usual inconvenient hour of 7.30, against which we have often protested. 8 p.m. is the usual hour for evening meetings in London; and it is best for a society to assimilate its hour of meeting to the usual custom, instead of maintaining an exceptional time.

Archæological Societies.

HAWICK ARCHÆOLOGICAL SOCIETY.—At a recent meeting of Hawick Archæological Society, Mr. J. W. Kennedy, the President, gave a contribution to the discussion on "The Catrail." This ditch, with a mound on each side, extended in a roughly semi-circular direction, with many and long breaks, from Torwoodlee on Gala Water to Peel Fell on the Liddle. The name would lead one to suppose that it was the work of the old Cymric tribes, Catrail, generally, being translated "the battle fence," and if this were correct it would not be more recent than 600 A.D., as the power of these tribes was entirely broken by the disastrous battles of Degsastan and Cattrueth, fought about that date. The one objection to the boundary theory, viz., the labour entailed, was more than counterbalanced by the evidences in its favour; for instance, on the ridge of a hill between the Borthwick and the Teviot, near Broadlee Loch, there was a part of the Catrail very distinct for about a mile, but as soon as it touched the burns on either side it stopped, while if these burns were followed the Catrail was again reached.

Competition.

PELHAM-ROAD COUNCIL SCHOOL, WIMBLEDON.—The assessor in the competition for this school, Mr. J. W. Simpson, F.R.I.B.A., has made his award, and that competitive plans will be open for public inspection at the Technical Institute, Gladstone-road, Wimbledon, on Thursday and Friday, September 12 and 13, from 10 a.m. to 4 p.m., and on Saturday, September 14, from 10 a.m. to 8 p.m.

Books.

Landhaus und Garten. By HERMANN MUTHESIUS. (München: F. Bruckmann. 1907.)

THIS volume is a continuation of a former work of Herr Muthesius, issued by the same publishers, "The Modern Country House and its Internal Arrangement" (Das moderne Landhaus und seine innere Ausstattung). Here, again, we have country houses of recent design shown with plans, elevations, and internal views; the examples chosen represent all countries. The present volume includes some illustrations of gardens to show their increasing architectonic importance. The 230 pages of illustrations are preceded by thirty pages of text; a most thoughtful, comprehensive, and illuminating essay on the country house.

The German word "Landhaus" is used to include, not only the genuine "country house" of our terminology, but also the suburban villa and the week-end cottage. The two latter are a much more modern development than with us; and this is due to the recent and extraordinarily rapid growth of German cities. When town workers first sought rural retreats the Italian villa served as model for this new type of dwelling; but the unsuitable, low-pitched roof gave way after 1870 to the higher pitch of the German Renaissance. More recently the burgher house and peasant's cot have influenced designs, which seem to find considerable difficulty in breaking away from street types in plan and elevation. Herr Muthesius refers sympathetically to the debt due to Norman Shaw and his work at Bedford Park, and he advises his countrymen to follow the same principles of simplicity and suitability.

Hitherto the landhaus has been conspicuous by pretentious plans and elevations, which are entirely out of keeping with country life and wants. The author justly says that, away from the formality of the town, large and high reception-rooms are out of place in a comparatively small house, and are especially undesirable when they cramp the bedrooms and offices. If people leave the town in search of fresh air and space, these advantages should not be confined to the rarely-used salon and dining-room, but should be equally distributed among the longer occupied rooms.

Herr Muthesius lays down excellent principles, not only for the disposition of individual rooms, but also for the house on its site. His preference for a south-east rather than for a south-west exposure for drawing-rooms, etc., appears strange to such as yearn for sun. The author deplores his countrymen's mania for multiplicity of features and their looseness in design. It is true that internal convenience should dictate the position of windows, but convenience is reconcilable with balance, and surely the architect's skill is as much evidenced by suitability of window spacing as by suitability of plan? Our German *confrères* do not seem to pay much attention to either detail. "Features" appear to be their one idea, and the smallest

elevation must have bays, turrets, and even loggias—whatever be the cost to the plan. If more of this perverse ingenuity were expended on a carefully considered plan, the gain would be immense to client and architecture alike. The German interiors show much stronger evidence of personality and individuality than do the exteriors, and they are correspondingly more pleasing.

Herr Muthesius indicates how design is moreover hampered by vexatious building laws. These show a want of logic which is surprising in our practical neighbours. While unduly thick internal walls are insisted on, and semi-detached houses are discouraged as impeding the free circulation of air, yet no apparent supervision is exercised over drains and sanitary details. Accordingly plans are passed which, in their disposition and arrangement, offend English ideas of suitability and hygiene. As with us, where a new suburb is opened up, no by-laws insist on a width and disposition of roads which shall cope with future traffic.

A large proportion of the illustrations show the work of architects other than Germans. Some of the Danish examples are quite pleasing. The English section is hardly representative. Evidently the selection indicates Herr Muthesius's own preferences. He must have had unequalled opportunities of judging English work during his appointment at his London Embassy. We remember with pleasure his skill and tact as chairman at a meeting of our Congress last summer.

Air Currents and the Laws of Ventilation. By W. N. SHAW, Sc.D., F.R.S. (Cambridge University Press. 1907.)

IN the lectures reprinted in this little book, the author says he has written down all that he knows, and perhaps a good deal that he has guessed, on the subject of ventilation. Neither of these statements should be taken literally, for it is tolerably clear that Dr. Shaw must know more than he has written, and it is not very clear that his guessing powers have been unduly exercised. Chapter I. contains a clear exposition of the laws governing the flow of air into and out of spaces to be ventilated. The analogy drawn between pneumatical laws and those controlling the distribution of electrical currents in a system of conductors is interesting. It may help those who are familiar with electricity to appreciate the principles involved in ventilation, but we do not admit its necessity or even its general utility. In the second chapter stress is laid upon the physics of the ventilated space, and here we quite agree with the proposition that a large air supply is necessary for ventilation without draughts. Dr. Shaw shows that the function of the air supplied is to remove surplus heat as well as surplus impurities, and to minimise the draughts frequently caused by convection in crowded spaces. The third and last chapter deals with the application of first principles to ventilation by open fires, open windows, Tobin tubes, cowls, and fans. As throughout the book the treatment of this controversial branch of the subject is lucid and well reasoned, and is calculated to help those who desire to arrive at a clear understanding of the principles governing, and we may add the difficulties attending, the design of ventilation systems. The work is by no means one of those handbooks from which the ignorant may pick out ready-made data to assist directly in the construction, or more probably the misconstruction, of a complete scheme of ventilation for a given or assumed building. On the contrary, it is a concise little treatise addressed to the man who wishes aid in studying the laws applicable to air currents in the practice of ventilation, and in thinking out solutions for the problems that have to be faced in that branch of physical science.

Ventilation, Heating, and Lighting. By WILLIAM MAXWELL, A.M.Inst.C.E., etc., Borough and Waterworks Engineer, Tunbridge Wells Corporation. Second Edition, Revised and Enlarged. (London Sanitary Publishing Company. 1907.)

THIS little book of 150 pages is divided into three unequal parts. The first on ventilation, comprising ninety-four pages, the second on heating, twenty-eight pages, and the third on lighting, fourteen pages. Sixteen pages are occupied by a chapter, entitled "Useful information," and by lists of manufacturers, engineers, etc., and of books on ventilation, heating, and lighting, and by a short index. It will be seen that in such a small space it is impossible for the three important subjects to be discussed in anything like an adequate manner. For example, only two pages are allotted to the important subject of heating by steam, and there is not a single illustration to say how the pipes and fittings are arranged.

Reorganisation and Costings, a Book for Manufacturers. By HARVEY PREEN, F.C.A. London: Simpkin, Marshall, Hamilton, Kent, & Co., Ltd.)

MR. PREEN has been here, there, and everywhere—with his eyes open—and now offers to others the benefit of his varied experience. In common with many critics of the British manufacturer, he has been impressed with his conservatism, and here seeks to show a more excellent way; directing his attention rather to internal economies of works than to those larger questions of tariffs, etc., which are so frequently regarded as being at the root of all commercial trouble. The lines upon which reform is suggested are sufficiently indicated by the title, but there are occasional excursions into the realms of finance. Were the author's conception of the duties of auditors held and acted up to by all accountants who undertake this important work, they would justly be regarded as "standing commercial counsels to their clients." "A pen-and-ink accountant, with his 'examined and found correct,' is as useful as a parrot," is one of many such *dicta*. These are often quaintly expressed, and, while in straining for alliterative effect, the result is not always happy, they are almost invariably pointed and suggestive.

In a medical treatise written for laymen we are frequently confronted with the advice, "call in the doctor," and Mr. Preen, while giving his own observations and suggestions, lays stress upon the advisability of consulting experts in engineering and other matters in which he does not claim to possess expert knowledge.

While it is undeniable that at one time the attitude of many of our manufacturers might fairly be described as one of unbending conservatism, views and methods have changed with the times. Few manufacturers will now be above taking a hint from such a keen observer as the author of this little volume—least of all those who have already found out for themselves and applied in their own case some of the reforms he advocates.

Architectural Hygiene or Sanitary Science as Applied to Buildings. By BANISTER F. FLETCHER, F.R.I.B.A., etc., and H. PHILLIPS FLETCHER, F.R.I.B.A., etc. Third Edition, Revised. (London: Whittaker & Co. 1907.)

THIS is the third edition of a book, the greater part of which originally appeared in our Student's Column about ten years ago. Additions have, however, been made, the most important being a chapter on drainage and water supply at a country house, and another on the lighting, heating, and ventilation of a City company's banqueting-hall. The book can be heartily recommended to students, but, in their attempt to deal with such a large subject in so small a volume, the authors have found it necessary to discuss some of the branches in outline rather than in detail. For example, acetylene-gas lighting is dismissed in a paragraph of eleven lines, and little more than a page is allotted to the important subject of electric-light wiring. We notice a few misprints, such as "tantilum" for "tantalum," "nurnet" for "nernst," on page 211, and "cevia" for "ceria" on page 205, and on page 145 the cubic space to be provided in board schools is not 80 ft. per head, as stated, but from 120 to 140 cubic ft. for all children except infants.

Modern Drainage Inspection and Sanitary Surveys. By GERARD G. J. JENSON, C.E. Second Edition, Revised and Enlarged. (London: The Sanitary Publishing Company. 1907.)

THE first edition of this book appeared about eight years ago, and the new edition is in the main a reprint. Small alterations and additions have been made, and two or three new illustrations have been inserted, the new matter amounting in the aggregate to about five pages. The book will be useful to all engaged in making sanitary surveys. It points out the defects of design and construction which are commonly met with, and gives practical information about testing drains, soil-pipes, and waste-pipes. Among the various kinds of water-closets described, we do not find any mention of siphonic closets, and there are no illustrations of waste and overflow fittings for baths. In a small book of this kind it is, of course, impossible to describe and illustrate every fitting of good quality, but the author has succeeded in compressing a large amount of useful information into a small space.

Concrete-steel Buildings. By W. NOBLE TWELVETREES, M.I.Mech.E., etc. (London: Whittaker & Co. 1907.)

THIS is a companion volume to the author's treatise on concrete-steel, in which the principles underlying the use of reinforced concrete were discussed. The book now before us describes and illustrates some of the most interesting examples of reinforced concrete buildings erected in this country and on the Continent and also in America. Among these can be mentioned transit sheds at Manchester Docks, store-houses at the Gennevilliers gas-works, Paris, railway warehouses at Bristol, Newcastle-on-Tyne, and London; factories and other warehouses at Chicago, New York, Philadelphia, Southampton, London, York, Swansea, and other towns. A very interesting chapter on some mishaps and their lessons draws attention to various failures which have occurred in reinforced concrete buildings, and it is well to know that, while some of these were due to defective design, others were the result of careless workmanship in mixing and depositing the concrete. The book is fully illustrated, and can be heartily recommended to all architects and engineers who are interested in this new method of construction.

Agglutinants of all Kinds for all Purposes. By H. C. STANDAGE. (London: Archibald Constable & Co., Ltd. 1907.)

THIS book contains over 500 recipes for the preparation of cements and agglutinants. The following are titles of a few of the recipes which are of interest to builders:—"Adhesive Coating for Damp Walls," "Cement for Terra-cotta," "Cement for Marble," "Cement for Lavatory Basins," "Waterproof Cement for Cisterns, Tanks, Tubs, etc.," "Cement for Damp Walls," "Mouldable Composition for Dados, Cornices, etc.," "Hydraulic Cement for Salt Water."

Some of the recipes appear to be very old, and not of a description to be recommended for use at the present time. For example, under the comprehensive title, "Cement for Architectural Purposes," we find the following:—

"Mix 1 lb. of alum, powdered, with 5 lb. slaked lime, and make into a paste with 37½ oz. of beaten bullock's blood. This cement is very useful for wood, plaster work, and as an architectural cement in general. This 'blood' cement is no doubt what has raised the suspicion in the mind of the natives of India and other countries that the blood of young children is used in building by the 'Christians.'"

Modern recipes have not, however, been neglected, and some useful information regarding casein paints is given. That portion of milk commonly known as "curd" consists of casein. Within the last ten years casein has come into extensive use for making washable distempers, and as an agglutinant and sizing material for paper. Ordinary casein paints dry quickly and without gloss. They are not readily rubbed off walls. When exposed to rains they are not so durable as oil paints.

Perhaps none of our readers will desire to make "Catch-'em-alive-O fly-papers" (recipe 283), or "Composition for dolls' heads" (recipe 466), but many of the recipes may prove useful in the house.

The book is of general interest, but will be most serviceable to workers in wood, stone, or metal.

Glues and Gelatine. By R. LIVINGSTON FERNBACH. (London: Archibald Constable & Co., Ltd. 1907.)

ALL who use glue in large quantity should read this book, but it is necessary to note that it is of American origin. When, for

instance, the author states that for the manufacture of carriages "there exists a rabid prejudice in favour of foreign glues," it is necessary to remember that he is referring to English glue as a foreign glue. In other parts of the volume, glue made in the United States is spoken of as "domestic" glue.

British and Continental glues are, apparently, superior to those made in America. The author says that much of the glue consumed in the United States is of foreign manufacture, and that if the tariff duty on imported glue were not so high as to be, in many cases, almost prohibitive, it is to be feared that some grades of foreign glue would supplant the corresponding grades of American manufacture.

The book is designed to acquaint users of glue with the methods employed by representative American manufacturers in grading and distinguishing between glues. The analytical and other processes used for testing glue and gelatine are described, and information relating to glue substitutes is given. A number of manufacturing receipts for liquid glues, pastes, and mucilages are included in Chapter IX.

The Encyclopædia of Practical Engineering and Allied Trades. Edited by JOSEPH G. HORNER, A.M.I.Mech.E. Vol. VI. (London: Virtue & Co.)

OWING chiefly to the alphabetical position of the subjects coming within this volume of the encyclopædia, mechanical engineering is even more prominent than in some of the parts previously issued. For this reason alone, and not at all as a reflection upon the value of the subject-matter, the present notice is somewhat briefer than usual. Some branches of carpentry and joinery are treated, the only one at any length being "Joinery," the illustrations to the article in question being scarcely up to the standard of excellence established and maintained elsewhere throughout the volume.

Trade Catalogues.

M. EDMOND COIGNET sends us a list of works which have been completed and are in course of execution on his system of reinforced concrete in this country. Among the fifteen examples of work quoted in the list, five refer to fire-resisting floor and column construction, three to strong-rooms and partitions, three to complete reinforced concrete buildings, and the remainder to miscellaneous structures, including pile foundations, a storage tank, and a retaining wall. The most important contract is that for the new manufactory of Messrs. J. C. & J. Field at Rainham, where three new warehouses and a range of coal bunkers are altogether in reinforced concrete, except the roofs, and a large amount of miscellaneous work has been done, including foundations for boiler-house and workshop walls, steam boilers, and a gas-engine, as well as tank supports, office floors, a slipway, and several small bridges.

Messrs. Joseph Wright & Co., of Tipton, send us a catalogue of their well-known Berryman calorifiers, which are made in various patterns to suit the requirements of hospitals, asylums, bathing establishments, hotels, and industrial works. The standard vertical type is to be preferred to the horizontal type in places where sufficient headroom is available, as the upright position is more favourable to the efficient action of the Π-shaped tubes constituting the heating surface. The horizontal type, however, is convenient for installation in confined spaces, and all the designs illustrated in the catalogue are distinctly suggestive of well-made and serviceable apparatus. Storage calorifiers are made in vertical and horizontal patterns for hot water supplies, and we may specially mention one of the former type with a separate storage cylinder which is particularly suitable for dealing with exceptionally hard water, because the deposition of scale takes place chiefly in the cylinder, whence it can be removed with a minimum amount of trouble. All types of calorifier can be fitted with automatic steam control, and are made suitably for low-pressure and high-pressure live steam or for exhaust steam. A new form of calorifier for utilising waste heat from internal combustion engines and acting also as an exhaust silencer is one that deserves the attention of gas and oil engine users. The catalogue would be more acceptable to architects if dimensions, duties, and other practical details were given for all types of the apparatus illustrated.

Messrs. William Goad & Co. have sent us a list of fire pumps, chemical fire extinguishers, and hand fire grenades. We have received a booklet, with no name on it, relating to "The Patent Invetrol Gas Light." This lamp resembles an inverted incandescent gas lamp, but the burner is supplied with petrol vapour instead of with coal gas. A straight tube, called the vapouriser, is situated above the mantle, and is kept hot by the waste heat from the burner. To light the lamp the vapouriser has to be heated for about one minute by a spirit flame or by other means. In the booklet before us it is stated that 1 gallon of petrol will yield a brilliant light for 100 to 120 hours, but the candle-power of the light is not mentioned. For country houses the light may be found useful, but it should be remembered that petrol is a highly-inflammable liquid, is far more dangerous than kerosene, and must be carefully handled. This is recognised in the booklet by the recommendation that "the containers should always be filled outdoors in daylight, with no lights or fires near."

The Adjustable Cover and Boiler Block Company send us a handy little pamphlet containing figured drawings of Marsh's overlapping boiler-seating blocks, liftable covers for side and downtake flues, front cross-wall blocks, and arch blocks for main flues. The special features of Marsh's adjustable covers are (1) that each cover is made in two parts, a shield or seat which is cemented in place, and the cover proper which is free to expand and contract with the boiler shell, and (2) that the covers overlap each other along the sides, thus preventing the admission of cold air to and the leakage of hot gasses from the flues. The blocks and covers also offer facilities for the thorough inspection of steam boilers without the necessity for dismantling the brickwork, and are conducive to safe and economical working.

Messrs. Hall & Pickles (Manchester) send us their new catalogue of steel work and girders kept in stock. The catalogue is very conveniently arranged giving in parallel columns the sectional size, length, weight per lineal foot, and code word for ordering, in connexion with each class of article in the catalogue. In the preface to this 1907 catalogue they observe—

> "We have altered the position of onco r two items. This, we think, will make the book more easy for reference, as under the new grouping all the rounds of various qualities come together, and in the same way all the squares and all the flats, etc. The various qualities we keep of any section will therefore be found on consecutive pages. We have also put the weights per foot opposite the sizes they refer to, instead of giving them in a separate portion of the book, as previously, and have further added a code word to each section, which, combined with the code on pages 167 to 182, will enable our customers to order conveniently and cheaply by telegram."

Messrs. John Spencer, Ltd. (Wednesbury), send us a sheet priced catalogue of their wrought-iron gas, steam, and water tubes and fittings, including artesian, petroleum, and oil well boring tubes; pipe joints; sewer ventilating shafts; solid-welded steel flange tubes for high pressure steam mains; iron telegraph and telephone poles, etc.

Correspondence.

MEDIÆVAL CHURCH PLANNING IN ENGLAND.

SIR,—I notice that, at the close of his article in your to-day's issue, Mr. Bond credits me with a plan of St. Mary, York, which is not mine. It was measured and drawn by Mr. W. H. Brierley, F.S.A., who kindly allowed me to use it in illustration of a paper which I wrote for the *Bulletin Monumental* and the *Archæological Journal*.

JOHN BILSON.

Hull, August 31, 1907.

INFANT SCHOOLS, ALFRETON.—New infant schools have been built on a site in Marshall-street, Alfreton. The premises, which will seat 412 infants, were designed by Mr. Percy Houfton, of Chesterfield. They comprise a central hall, with classrooms placed in pairs as four radial wings to the central hall. The contractors were Messrs. Maule & Co., of Nottingham, and the total cost of the schools will be over 4,000*l*.

The Student's Column.

MODERN METHODS OF USING GAS.—IX.

Lamps for Streets, Railway-stations, and Open Spaces—Automatic Lamp-lighting.

CLUSTER LAMPS.—For lighting important thoroughfares, as well as for shop-lighting, lamps containing two, three, or more burners are frequently used. Some gas engineers have copied electric arc lamps as closely as possible in designing street lamps, and have even gone so far as to give to the cluster lamp, when provided with a large globe, the inappropriate name, "gas arc lamp." Even with low-pressure gas some excellent lighting results have been obtained by placing a number of high-power burners in a cluster in a glass globe surmounted by a suitable reflector, and suspending the lamp from a swan-necked column. The "Humphrey" lamp is a good cluster lamp of this description which is extensively used both for outdoor lighting and for lighting shop interiors. By arranging mantles in a cluster there is a tendency towards waste of light owing to obstruction of the rays from one mantle by the mantles in close proximity to it. Where, however, brilliancy of light, and not economy, is of primary importance, four or five mantles may be used in the cluster.

Where high-pressure gas is available better results can be obtained than with low-pressure gas, and in most large towns instances of effective lighting with high-pressure gas can be seen, but the number of streets lighted with high-pressure gas is insignificant when compared with the number lighted with low-pressure gas.

Inverted Burners for Street Lighting.—Lamps fitted with inverted burners are being used in the streets of Edinburgh and in several other towns, and are reported to be giving great satisfaction; but until they have been in use for a long period it would be premature to recommend the general substitution of inverted burners for the upright burners at present in use. Many of the lanterns now used with upright burners would not be suitable for use with inverted burners.

Examples of Street Lighting.—As illustrations of streets lighted by gas in three different ways, the following streets in the City of London may be mentioned:—

Fleet-street.—This street is lighted with low-pressure gas. Each lantern contains two burners of the "C" type fitted with glass chimneys. The columns are 9 ft. 6 in. high.

Queen Victoria-street.—In this street each lamp is supplied with gas under a pressure of about 10 in., but it has not been necessary to provide a compressing apparatus in this case, because the gas company happen to have in the subway which exists under this street a high-pressure distribution main in which the gas is always under a pressure of from 10 in. to 20 in. In order that the gas shall flow to the lamp under a constant pressure of about 10 in., a Keith's mercurial governor has been fitted to the supply pipe in the base of each column. Each lantern is windproof, and is fitted with two Keith's burners, each of 300 candle-power, and each consuming 10 cubic ft. of gas per hour. Each lamp is, therefore, of 600 candle-power. The two burners are provided with one of Keith's flashing by-pass cocks, and are fitted upon a mercurial anti-vibrator. The anti-vibrators prevent the heavy traffic from causing an excessive mortality amongst the mantles. The columns are 12 ft. in height from pavement to frog, and are about 58 yds. apart if measured in a straight line, or about 33 yds. apart if measured diagonally.

Lower Thames and Monument streets.—Here a subway exists, but no high-pressure main. The low-pressure supply has, therefore, been converted into a high-pressure supply with the aid of Keith water compressors erected in the subway. The street lamps are of 300 candle-power, but the two placed over the refuges in front of Billingsgate market are each of 900 candle-power. The lamps of 300 candle-power are placed on columns 10 ft. 6 in. high.

Kingsway and Aldwych.—Just outside the City boundary are the new thoroughfares, Kingsway and Aldwych. These are lighted by the "Millenium" system. The gas is compressed to about 50 in. of water, the

compressors being housed in the adjacent Law Courts.

Railway-stations.—For lighting the platforms of railway-stations gas lamps similar to those used for street lighting are commonly employed. At Victoria Station (L.B. and S.C.R.) the "Sale-Onslow" system is in use. The gas is supplied to the burners under a pressure of about 50 in. The smaller burners yield light of about 175 candle-power, and consume 5 cubic ft. of gas per hour, while the larger burners yield light of about 400 candle-power, and consume 10 cubic ft. of gas per hour. Broad-street Station, the London terminus of the North London Railway, is also lighted with high-pressure gas. The gas is drawn from the gas company's high-pressure main. The gas supplied to the lamps has its pressure reduced to a constant pressure of 10 in. by the provision of a governor on each of the two 300-light meters at the station. The platforms are lighted with Wm. Sugg & Co.'s "Newark" lamps, each lamp being of 300 candle-power. The lamps are about 35 ft. apart, and each consumes 10 cubic ft. of gas per hour.

For use with pressures approaching 50 in., mantles of greater strength than those used with low-pressure gas have to be provided. The different firms which instal high-pressure lamps supply mantles specially made for use with the burners installed.

"C" Bulb Lamp.—When gas under ordinary pressures has to be used for lighting railway platforms, the "C" bulb lamp (Fig. 18), placed in a suitable lantern to prevent gusts of wind from interfering with the gas flame, is often used. In situations not exposed to draughts, it is not necessary to encase the lamp in a lantern. The white-enamelled reflector throws the light downwards, and the use of a glass bulb in place of a narrow chimney reduces the number of breakages of glass and mantles. Each lamp gives light of about 60 candle-power, and

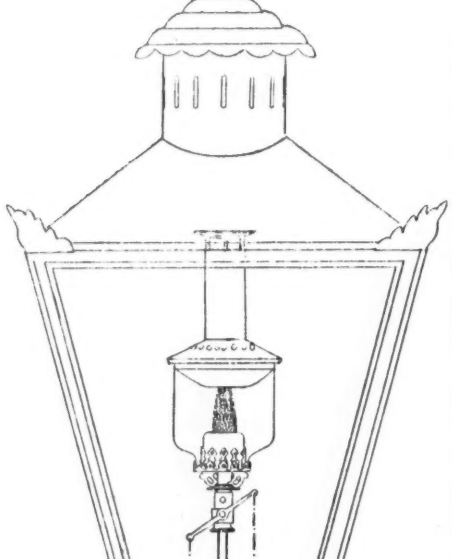


Fig. 18. *Bulb Lamp in Lantern.*

consumes gas at a rate of about $3\frac{3}{4}$ cubic ft. per hour. The lamps are usually fixed at about 9 ft. above ground level. Each lamp is provided with a by-pass, and the gas supply is fitted with a special control arrangement by means of which the gas supply is reduced while no business is being conducted on the platform.

Lowering Lamps from High Columns.—Gas lamps suspended from high columns may be lowered for cleaning in a manner similar to that in which electric arc lamps are lowered. A method of lowering gas lamps which has been introduced by the inventors of the Sale-Onslow system of lighting is illustrated in Fig. 19. The lamp is suspended from the wire rope A, and is connected to the gas supply by the flexible metal tube B.

Automatic Lighting and Extinguishing.—Lamps provided with a by-pass may be automatically lighted and extinguished at any desired hours by attaching to the burner a clockwork device made specially for this purpose, or by providing each burner with a

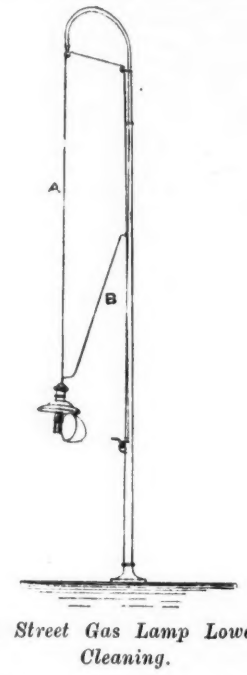


Fig. 19. *Street Gas Lamp Lowered for Cleaning.*

controlling device which is actuated by a temporary increase in the compression of the gas in the street mains.

Clockwork Lighters.—Gunning's apparatus for automatically lighting and extinguishing street lamps is being extensively used in rural and suburban districts for lamps situated in isolated positions. It consists of a clock fitted with a circular disc to which are attached adjustable pawls. The disc makes one revolution in twenty-four hours. The positions of the pawls are changed when changes are made in the times decreed for the lighting and extinguishing of the gas. The clock is usually wound once a week. Another clockwork arrangement for lighting and extinguishing burners at predetermined times is that known as the "Horstmann gas controller."

Pneumatic Lighters.—In the case of pneumatic lighters the street lamps are all lighted simultaneously by increasing the pressure of the gas (by manipulating the governor at the gasworks) slightly above its normal limit for about thirty seconds. The increased compression of the gas operates the special contrivance with which each lamp to be lighted is provided. When the lamps are to be extinguished the pressure of the gas is temporarily increased as before, and the gas supply to each burner is thereby cut off, with the exception of the small supply which flows through the by-pass. Dr. Rostin, of Berlin, and Alder & Mackay, of Edinburgh, have introduced automatic lighters which work upon this principle.

HOUSING IN MIDDLESEX.

DR. C. W. F. YOUNG, Medical Officer of Health for the County of Middlesex, issued on Friday his annual report, which includes a summary of the annual reports of the district medical officers of health. References to housing conditions in the summary mentioned are as follows :—

Brentford.—Dr. Bott directs attention to the old and insanitary property which exists immediately at the rear of the houses forming the north side of the High-street. It would appear that action in dealing with these slum areas has been in abeyance, owing to the prospect that steps would shortly be taken with a view to the widening of the very narrow High-street, an improvement which has been under the consideration of the District Council and of the County Council for some time past, but as regards which, for one or other reason no definite decision had been arrived at up to the end of the year. It is also stated in the report that there "are several bad properties in New Brentford," and Dr. Bott recommends as regards all these insanitary properties that they should at an early date be visited by the Sanitary Committee, the Surveyor, and himself in order that some plan may be devised for the improvement or demolition of the houses so far as it is possible to do this without inflicting unnecessary hardship on the occupants, or bringing about overcrowding in other houses. He reports that during the year a great improvement was effected by making a road "from High-street to Albany-road, through the One Tun-yard, thus opening up Old Spring-gardens and Harding's-court," which he anticipates will now speedily disappear.

Chiswick.—In the report of Mr. Clarke, the Sanitary Inspector, it is stated that increasing attention has been given to systematic house-to-house inspection, and attention is drawn to the advantage of this procedure in maintaining premises in a satisfactory condition. A total of 2,721 houses was inspected in this way during the year, and it appears that at these inspections a census of inhabitants is taken, which is of assistance in arriving at the estimated population of the district. Under the revised by-laws relating to new streets and buildings it has been possible to deal more effectively than before with the paving of yards. Owing to the close attention devoted to old property it has not been found necessary to take any action under the Housing of the Working Classes Act.

Edmonton.—The Medical Officer of Health specially refers to the work done under By-law 113 of the "By-laws relating to New Streets and Buildings," which were revised in 1904 and approved by the Local Government Board in the same year. The effect of this by-law is that a person shall not let or occupy a new building until it has been after examination certified by an officer of the District Council to be in his opinion in every respect fit for human habitation. The duty of certifying has been placed upon the medical officer of health. During the year the total number of new houses inspected for this purpose was 376, of which 254 were passed upon the first inspection, seventy-six on the second inspection, twenty-seven on the third inspection, four on the fourth inspection, and two after five inspections. Of thirteen houses not passed at the end of 1906, nine had been inspected once, three three times, and one on five occasions. Dr. Lawrence stated: "During the year the Council have taken legal proceedings against seven persons; convictions were obtained in all cases except one, against whom the case was dismissed, as there was no evidence to show that he was the person who actually let the premises in question." Closing orders under the Housing of the Working Classes Act were obtained in four cases. It is reported that plans for the erection of artisans' dwellings at an average rent of 6s. 6d. per week on a site purchased by the District Council for the purpose were considered during the year, but the scheme is still in abeyance.

Enfield.—Eleven cottages in Gordon-lane were reported by the Medical Officer of Health, six being unfit for human habitation and five in need of repair and a proper water supply. They have since been put in order, and two cottages closed in 1905 by closing order have also been remedied.

Finchley.—Dr. Taylor reports that the housing accommodation for the working classes is ample, but that complaint is made that the rents are as a rule more than they can afford. Building is actively taking place in the district, and during the year 442 new houses were passed as fit for occupation. During the year 294 house-to-house inspections were made.

Hampton.—It is reported that a large number of new houses were erected during 1906. One house was closed as being unfit for human habitation, and two others, previously closed by magistrates' orders, have since been demolished. Fifty-six house-to-house inspections were made during the year.

Hampton Wick.—Dr. Gunther, in referring to the fact that the District Council has adopted Part III. of the Housing of the Working Classes Act states: "At present your Council has not succeeded in finding suitable building ground," and adds that no vacant cottages are available for working men, although it would be a great boon to those who live in lodgings, or have work in the district, if they could get cottages at a reasonable rent.

Hayes.—It is reported that a considerable increase in the number of small houses and cottages has taken place during the year, and that the housing accommodation is at present sufficient for the needs of the district.

Hendon (Urban).—Dr. Andrew reports that the need of dwellings for the working classes is felt in parts of the district, especially at Child's Hill, where some of the houses are dilapidated and overcrowded. He states that the District Council have considered the question on several occasions, that plans for the erection of workmen's dwellings have been invited, and that a favourable termination is anticipated.

Southall-Norwood.—Dr. Windle writes that during the year 328 houses (including thirty-one shops) were certified as fit for occupation. No proceedings under the Housing of the Working Classes Act were taken during 1906.

Southgate.—Dr. Ransome states that under the provisions of the Housing of the Working Classes Act one cottage was closed and four cottages were closed and demolished. These were all at Winchmore Hill. One cottage at Palmer's

Green was repaired and made fit for habitation. He draws attention to the existence of "many other old cottages remaining in different parts of the district which ought to be pulled down and which would be condemned except for the fact that there are no better ones for the occupants to go into if this were done," and he further points out that when such cottages are demolished by the owners, the sites are used for the erection of villa and shop property. In his opinion the necessity of providing suitable dwellings at a reasonable rent for the working classes becomes each year more urgent, and he expresses the hope that the District Council "will not lose sight of this important matter."

Staines (Urban).—The housing accommodation appears to be sufficient for the needs of the district, but it is stated that there are some old cottages, several built of wood, which do not comply with modern requirements.

Teddington.—Dr. Gunther writes that after the adoption of Part III. of the Housing of the Working Classes Act the District Council selected a site of six acres for the erection of artisans' dwellings, and that a Local Government Board inquiry was held in November, 1906, in regard to an application to borrow 4,200*l.* for the purchase of the site. The Board had not given their decision at the end of the year. In connexion with the inquiry a house-to-house inspection was made of twenty-eight streets, chiefly occupied by weekly tenants, and information obtained as to rent, number of inmates, and rooms in each cottage. The results are given by Dr. Gunther as follows: "That there are about 829 houses in the parish containing 4,454 persons of the labouring class. This gives an average population of 5·37 inhabitants per house. Four of these houses contain three families each, and 177 two families each. The majority of the cottages are let at rents ranging from 7s. to 9s. per week. There are a few let at 6s. 6d. per week and under. Houses occupied by two families contain four, five, and six rooms. Although these houses are not overcrowded to the extent that would justify my recommending proceedings, still they contain more people than is desirable for consideration of health. The cottages are not adapted for two families and have only one kitchen, one wash-house, and one water-closet. In my report for 1905 I drew the Council's attention to the desirability, if possible, of making provision for housing the working classes. Suitable land in the district each year becomes scarcer, and more difficult to obtain at a reasonable price, hence unless measures are at once taken it will hereafter be impossible to make any provision. There can be little doubt that the over-populating of the houses referred to is due to high rents, and in my opinion it would be a great boon for many families who have to live in lodgings to be able to get a cottage at a rent which does not absorb one third of a workman's wage. There should be no difficulty in providing houses that would be financially self-supporting and not chargeable on the rates."

Tottenham.—It is reported that the various schemes for the provision of houses under the Housing of the Working Classes Act have been abandoned, and part of the land provided for this purpose has been disposed of by the District Council. Two large estates in the district have recently or are now being built upon, viz., by the London County Council and the Peabody Trust. Seven houses were demolished during the year owing to representations to the owner by the local authority as to their unfitness for human habitation, and it was not necessary to resort to legal proceedings.

Twickenham.—A house-to house inspection was made of the premises in eighteen streets. It does not appear to have been necessary to apply for any closing orders as regards any premises.

Wembley.—Dr. Goddard refers to the fact that a few years ago the question of action under the Housing of the Working Classes Act, with a view to the erection of artisans' dwellings was mooted. He now reports that a large number of small houses have been erected by private owners, and that it cannot now be said that there is insufficient housing accommodation, although the rents are high. He further adds that as regards many of these new buildings their construction "can only narrowly comply with the wording of the by-laws, and one doubts whether the woodwork especially is ever substantial enough to ensure its durability, or any real comfort, to the occupiers."

Wood Green.—In the report of the Sanitary Inspector information is given as to the results of house-to-house inspection. This work was temporarily interfered with owing to the resignation of one of the inspecting staff. A total of 206 houses in six roads were visited. These contained 1,163 rooms, occupied by 625 adults and 586 children, or an average of 1·01 persons per room. A considerable number of defective conditions were found and remedied.

Hendon (Rural).—Dr. Campbell Gowan reports that 156 houses were erected during 1906, but adds that there is still great need for cottage accommodation for the working classes in many parts

THE BRITISH MUSEUM.

SIR E. MAUNDE THOMPSON'S report for 1906 states that for many years serious defects have shown themselves in the facing stones of the Museum buildings, being chiefly due to the employment, during construction, of iron plugs instead of copper plugs for bonding, with the result that a very large portion of the surface has been cracked and burst by oxidation of the iron. Repairs have been in progress since 1905, and will be continued until the injuries have been made good. As a further precaution against fire, the interior of the roof has been divided into smaller "risks" by the introduction of sectional walls; an elaborate system of lightning conductors has been installed; and the opportunity has been taken to bring the fire-staff, formerly lodged some distance away, into residence in a spare house in Montague-place. The planing and polishing of all the wooden floors of the Museum galleries has now been completed. The improvement in the cleanliness of the galleries, and even of the interiors of the show-cases, into which under the old system the floating dust continuously raised by the traffic of visitors penetrated in spite of all precautions, is ample compensation for the time and money expended on the work. Improvements have been effected in the ventilation and lighting of some of the exhibition galleries by the introduction of electric fans and additional skylights.

In the department of MSS. Mr. G. F. Warner's catalogue of additions includes:—Drawings of architectural details of English churches, castles, old houses, etc., by C. A. Buckler, XIXth century (from 1843); bequeathed by the artist. Drawings of churches in Northamptonshire, with notes, by Gilbert Fletcher, of Towcester, 1807–12, 3 vols.; presented by Mr. H. S. Smith-Rewse. Collections by the late Sir H. Dryden, Bart. (d. 1899), relating to Picts' houses, stone circles, etc., in Scotland and the Shetland Isles, with drawings, plans, etc.; 7 vols.

In regard to the department of Egyptian and Assyrian Antiquities, Mr. E. A. Wallis-Budge, the keeper, has prepared an interesting list of the year's acquisitions, which include:—(*Egyptian*). Large limestone stele, in the form of a door sculptured on both sides. On the one side the deceased Rā-men-kheper is seen adoring Rā-Harmachis, and on the other he adores Osiris; below are smaller reliefs in which the son of the deceased is represented performing ceremonies on behalf of his father; XIXth dynasty, B.C. 1350. Kneeling stone statue of the priest Patā-Ast, holding a shrine containing a figure; XVIIIth or XIXth dynasty, B.C. 1450–1350. Artist's palette in ornamented leather, with a support for the wrist, water vessel, and cavities for the reed brushes; found at Akhmim, and belonged probably to the VIIIth century A.D. Limestone stele, sculptured with figures of the deceased praying to the Day-Sun and the Night-Sun, and inscribed with the text of a hymn in sixteen lines, which contain unusual spelling of hieroglyphic words; about B.C. 400. Granite sepulchral stele, with a bilingual inscription in hieroglyphics and demotic; above is a figure of the deceased worshipping six gods; *Ptolemaic period.* Large sandstone stele inscribed with eleven lines of text, recording the dedication of certain offerings to the Cow-goddess Hathor at Karnak by the Emperor Tiberius; on the upper part is a figure of the Emperor standing before the goddess. Granite base of a statue inscribed with the cartouches of Queen Shep-en-Apt, Amenartās, and Piānkhi; about B.C. 700. Limestone base of a pillar, which has been hollowed out and made to serve as the apse of a small shrine in a Coptic church; the decoration consists of birds, plants, etc., in low relief; VIIth to IXth century A.D. A hard dark granite statue of Sen-Mut, the famous architect and builder of the temple of Tcheser Tehesern, *i.e.*, the "Holiest of the Holy," of Queen Hātshepset, who reigned over Egypt about B.C. 1550. Sen-Mut was the "Chief of Works" in all Egypt, the "Chief Craftsman" of every trade, and he was the overseer of the house wherein the tribute in gold paid by the Sūdān was stored; the Queen adopted male attributes and attire, and she appears in this statue as the "Young Horus," whom the architect holds on his knees. (*Assyrian*). Large inscribed baked clay cone of Samsuiluna, King of Babylon, about B.C. 2145; the inscription, which is in seven columns, commemorates the rebuilding of the great wall which surrounded the city of Sippar in Babylonia; this cone is a foundation memorial, and was found buried in a wall; it is the largest example of the class now known, and is a very valuable addition to the memorial inscriptions of the First Dynasty of Babylon, which are very rare. Limestone slab, sculptured with the figures of two bowmen; it was one of the series which lined a corridor in a palace of one of the later kings of Assyria, about B.C. 650. (*Himyaritic*). Yellow marble figure of an official or priest, period uncertain, from Hadramant, and portions of four Himyaritic inscriptions cut in relief upon marble, the texts referring to the dedication of certain buildings to the god Al-Mokah, about B.C. 700; presented by the Duchess of Connaught. A group of fragments of relief, etc., from the Temple of Neb-hapt-Rā, a king of the XIth dynasty; from Dēr-al-Bahari. Several objects of the XIIth and later dynasties. Objects of the Ptolemaic and Roman periods from Bahnasâ and Al-Hība; presented by the Egypt Exploration Fund.

In the department of Greek and Roman antiquities Mr. Cecil Smith reports that in the terra-cotta room the new cases on the south side have been completed, and the terra-cottas have been replaced in them. The room hitherto called the Etruscan Saloon has undergone an entire rearrangement with a view to the provision of space for the exhibition of a series of objects illustrating the public and private life of the Greeks and Romans. Considerable progress has been made with the arrangement of objects for this exhibition. In the fourth vase room a table case has been specially fitted for the exhibition of Greek and Italian vases with moulded designs. Casts of several fragments have been procured from Athens and fitted to the Parthenon Frieze. A series of pictures illustrative of the sculptures has been framed and placed in the Elgin and Philalegian rooms. The walls and ceiling of the Ephesus room have been repainted. A new door has been made giving access to the inscription room from the Mausoleum Annexe. In the Hall of Inscriptions the plaster cast of a restored capital has been placed on the inscribed pier from Priené. The objects found in the excavations at Ephesus have been temporarily exhibited in the medal room lobby. The acquisitions during the year included four objects in gold, three in silver, seventeen in bronze, including several statuettes, six engraved gems, twenty-five objects in marble, etc., including an inscribed marble sarcophagus, said to have been executed in the ruins of the temple of Kybelè at Sardis; four examples of pottery, and fourteen objects in iron. All these things were obtained by purchase, and there were many other additions received by way of presentation from the Greek Government, the Committee of the Egypt Exploration Fund, Sir Henry Howarth, Dr. Arthur Evans, F.R.S., the British School of Archæology in Egypt, Mr. R. Phenè Spiers, and others.

In the department of British and mediæval antiquities numerous acquisitions, as catalogued by Mr. Charles H. Read, include fragments of inscribed stones and ivory carvings found with other remains on the site of a Roman villa in Greenwich Park, 1904; presented by his Majesty's First Commissioner of Works. A series of cinerary urns, vases, and dishes from burials at Seaford, Sussex; given by Mr. Hilton Price. Large pottery fragments with applied ornament, XVIth century, from Christ's Hospital, Newgate-street; given by Mr. C. R. Baker-King. Marbles and painted fragments of the Roman period from Oxyrhynchus; given by the Egyptian Exploration Fund. An important series of temple pictures and ceremonial objects collected during the Tibet Expedition; given by the Government of India. A large and important series of steatite carvings from Mendi-land, Africa; these carvings are found buried in the earth, and their origin is unknown to the natives, who regard them with especial veneration as agricultural charms; collected by Lieutenant A. W. Boddy. A series of pottery vessels, including the chief types in common use at Mombasa; collected by Mr. A. C. Hollis.

At the Natural History Museum Sir E. Ray Lankester reports that the drainage of the Museum at South Kensington by an improved system has been completed, the work having been carried out by his Majesty's Office of Works. The electric light having been installed in the studies throughout the building, the First Commissioner of Works has been asked to submit a plan for lighting the galleries. The heating apparatus, which has been in use since 1880, having become very defective, the trustees have been in communication with the First Commissioner with reference to a new installation of pipes, etc., for warming the building. A scheme prepared by the Chief Engineer of the Board of Works for the better heating and ventilating of the Museum is under consideration.

SUNDAY SCHOOL, BRADFORD.—The foundation-stone was recently laid of a new building for the accommodation of the Sunday-school in connexion with Muff Field Wesleyan Reform Chapel, Bradford. The building, which is being erected on a site adjoining the chapel, will contain a schoolroom 68 ft. long by 44 ft. wide, with galleries on three sides, giving accommodation for 530 scholars on the ground floor and 370 upstairs. The side classrooms will be enclosed by movable partitions, so that they can be thrown into the main floor on the occasion of large gatherings, affording a total seating accommodation for 1,050 children or 875 adults. Provision is also to be made for a minister's vestry, choir vestry, and young men's and young women's rooms, and in the basement there will be a tearoom, a gymnasium, social-room, kitchen, and fireproof heating-chamber. The architects are Messrs. Walker & Collinson, of Bradford.

General Building News.

NEW CHURCHES, WIMBLEDON.—Steps are being taken to provide new churches in this rapidly-growing district. It is proposed to build the permanent church of St. Matthew in Cottenham Park, and to erect four churches—that is, for the new parish of St. Andrew, in Merton, between Wandsworth and Earlsfield, near Wimbledon Park Station, at a cost of 10,000*l.*, and in Wimbledon Park at a cost of about 5,000*l.*

WESLEYAN METHODIST CHURCH, PONTELAND.—A new church is being built for the Methodists of Ponteland. The new building will seat 350 worshippers, and its estimated cost is about 1,200*l.* The architect is Mr. J. W. Taylor, Newcastle.

ROMAN CATHOLIC CHURCH, CURTROE, YOUGHAL.—In the village of Curtroe, near Youghal, the new church of St. Ita was recently dedicated. The architects for the work were Messrs. Murray & Son, of Youghal.

CHURCH IMPROVEMENTS, RAFFORD, N.B.—The parish church of Rafford was recently reopened after undergoing extensive improvements and alterations. The old plaster ceiling has been removed, the domed roof laid bare and finished in pitch-pine stained the colour of the old wood, and the old gallery has been removed. Three new windows have been introduced in the east wall, and a dado of pine has been placed right round the church, the woodwork of the old gallery front having been utilised for the purpose. The walls are painted in light olive. A vestry has been built on the east side of the church, of hexagon form, and in the basement of this addition is placed the new heating apparatus, which is on the low-pressure system. The church windows have been refitted with leaded glass. The whole alterations have been carried out from plans by Mr. Macgregor Chalmers, Glasgow, and the contractors were: Mason, David Ross, Forres; carpenter, James Robertson, Forres; painter and glazier, Arch. Macdonald, Forres; plasterer, Angus & Ross, Forres; plumber, Hugh Laing, Forres; lamps, Mackenzie & Cruickshank, Forres; and heating, James Combe & Son, Glasgow.

CHURCH RESTORATION, BOWDEN, N.B.—A fund is being raised for the restoration of the ancient Parish Church of Bowden, which was founded in 1128 by the monks of Kelso. The plans for the restoration of the building have been prepared by Mr. M'Gregor Chalmers, architect, Glasgow, and the work is estimated to cost 2,000*l.*

BAPTIST CHAPEL, MANOR PARK.—A new Baptist Chapel has been built in High-street North, close to Manor Park Broadway. The chapel is so designed that a gallery can be added at a later date, when there will be seating accommodation for 450 people. There are three large vestries at the rear, which are so designed that they can be thrown into a Sunday-school, which will accommodate 150 children. It is intended to build another schoolroom over these vestries, and already ample kitchen and lavatory accommodation has been provided. The architect is Mr. Frank Scrivener, of Forest Gate.

CHAPEL IMPROVEMENT, KINGSTON, HULL.—The Kingston Wesleyan Chapel was recently re-opened after having undergone various repairs and improvements. Sir W. A. Gelder has been the architect superintending the work, and Mr. Levitt the contractor.

WESLEYAN SUNDAY SCHOOL, LEEK.—A new Wesleyan Sunday School is being built in Mill-street, Leek, at a total cost of about 800*l.* Mr. J. T. Brealey is the architect, and the work will be carried out by Mr. Sampson Salt.

PRIMITIVE METHODIST SUNDAY SCHOOL, STANDISH.—The new Primitive Methodist Centenary Sunday School at Standish was opened a short time ago. The architect was Mr. W. H. Dinsley, of Chorley, and the builders were Messrs. A. Bywater & Sons, of Pemberton.

PROPOSED CONGREGATIONAL SCHOOL, SILCOATES.—It is proposed to rebuild the Northern Congregational School, at Silcoates, near Wakefield. The whole of the school buildings are to be of fireproof construction, and are designed to harmonise with the existing master's house. They will be faced with specially-made bricks and stone dressings. The architects are Messrs. Oliver & Dodgshun, of Leeds, their designs being selected in competition by Mr. John Ely, of Manchester, who acted as assessor. The contracts will be let when the plans have passed the Rural District Council. The work is estimated to cost about 12,000*l.*

NEW SCHOOLS, GRESFORD.—A new girls' and infants' schools, erected at a cost of 2,578*l.*, have been opened at Gresford. The schools are built of pressed brick with stone dressings, and consist of a central hall, with class-rooms attached. They were designed by Mr. G. Morrison, architect, Wrexham.

NEW SCHOOL, BO'NESS, N.B.—The New Grange School has just been opened. The building is of local white freestone, and provides accommodation for 1,000 children. There are eighteen classrooms, eight being situated on the ground floor and ten on the first floor. Three rooms are set apart for supplementary work. The class-rooms are arranged around a central hall measuring 90 ft. long by 30 ft. broad, covered by a glass roof. A balcony runs right round, from which the upper classrooms are reached. Round the walls are blackboards for free-arm drawing. Every room has a special outlet leading to the air-ducts situated on the roof, and fresh air inlets are provided on the windows of each classroom. The school is heated by hot water throughout, and lit by electric light. The total cost is about 14,000*l.* The architects were Messrs. H. & D. Barclay, Glasgow.

COUNTY COUNCIL SCHOOLS, BARRY.—The opening of the new Council schools which have been erected in Gladstone-road, Barry Dock, at a cost of about 17,000*l.*, took place a short time ago. Accommodation is provided for 402 boys, 402 girls, and 400 infants, and in each of the three departments there are nine class-rooms capable of accommodating forty to fifty scholars. Each department has also an assembly hall. A manual instruction room, capable of accommodating twenty pupils, has been provided in the boys' school, whilst in the girls' department there is a cookery kitchen, in which fifty-four girls can receive demonstration lessons. The main structures are of brick with blue Forest stone dressings. A dado of buff-coloured glazed bricks has been placed round the rooms and corridors. Heating will be by low pressure hot water, accelerated by steam. Open-bladed fans will provide ventilation, the appliances being capable of changing the air eight times during the hour. The work of construction has been performed by Mr. Alban Richards, contractor, Barry Dock and Pentre, from designs and under the superintendence of Mr. G. A. Bikenhead, architect to the authority, Mr. Charles Davies acting as clerk of the works.

NEW PUBLIC BATHS AT HAMMERSMITH.—The new baths and washhouses which have been erected for the Hammersmith Borough Council were built from the designs of Mr. J. Ernest Franck. The principal frontage of the baths is situated in Lime-grove, and has been carried out in red brick and Portland stone dressings, the roof being covered with Piecelly slating. The frontage to Scott's-road has also been carried out in red brick. In addition to the first and second class swimming-ponds, which are 105 ft. by 34 ft. and 100 ft. by 30 ft., and have eighty and 102 dressing-boxes respectively, fourteen slipper and lassar, or spray, baths have been provided in the men's first-class private baths and twenty-eight in the second class. There are seven slipper and lassar baths in the women's first-class private baths, and fourteen in the second class. A public washhouse has been provided, containing thirty stalls, all fitted with hot and cold water and a steam copper. There is also a public ironing room, an establishment laundry, and the usual ticket offices, etc. The men's first and second class slipper and lassar baths have inter-communication, so that during slack periods one attendant can manage both sets of baths. A similar arrangement has been adopted in connexion with the women's private baths. The whole of the accommodation, including the boiler-house, heater-room, etc., excepting the residences of the superintendent and engineer, has been obtained on the one floor. The entrance to the superintendent's residence is situated in Lime-grove, as is also the committee-room, the entrance to the first-class swimming-bath and men's first-class private baths, the entrance to the women's first and second class private baths, and the entrances to the separate corridor giving access to the first-class bath when used for entertainments. This latter corridor is used by the women when the first-class bath is reserved for them. The entrances to the second-class men's swimming and private baths and the public washhouse are in Scott's-road, as is a separate entrance for the engineer to his residence, and an entrance to the yard for the delivery of coal to the bunkers adjoining the boiler-house. The boiler-house has been placed almost centrally between the two swimming-ponds with access to Scott's-road through the yard, beneath which are the coal bunkers. The walls internally are finished with glazed bricks, with the exception of the corridors, which have glazed-brick dados to a height of 7 ft. The floors have been laid down chiefly in mosaic, with the exception of the portions between the dressing-boxes and the swimming-ponds, which have been finished with a ribbed tile to prevent slipping. The floors of the baths themselves are finished in granolithic paving. The first-class swimming-pond has a segmental roof carried out in reinforced concrete by the New Expanded Metal Company, and has a span of 50 ft. The galleries which run round this bath have also been formed in the same material, and are constructed on the cantilever principle. The walls of the bath are in ivory white glazed bricks, with the cornice, architrave, and window dressings in the white glazed stoneware of Messrs. Doulton & Co. This portion of the building has a separate installation for heating and ventilation. When this bath is floored over, as an entertainment hall, it will, with the galleries, have accommodation for 1,400 persons. A feature in connexion with the first-class swimming-pond is that about 20 ft. from the deep end of the bath the basement has been sunk to a depth of 8 ft., so as to allow of exhibitions of high diving, etc. The contract for the erection of the baths amounted to 45,000*l.*

PUBLIC BATHS, GARSTON, LIVERPOOL.—New public baths have been erected by the Liverpool Corporation in Speke-road, Garston. Only a part of the scheme has been carried out, the cost having been about 15,000*l.* The complete scheme, it is estimated, will cost a further 11,000*l.* The portion proceeded with was the swimming and part of the private bath departments, all of which occupy the back portion of the site. The washhouses and the private baths, together with the superintendent's residence, which formed the front of the building, were omitted. The establishment just opened comprises one swimming-bath, 75 ft. by 35 ft., having fifty-seven dressing-boxes. This bath is fitted with a permanent gallery for use at swimming galas, etc., and during the winter months it will be converted into a public hall. There is also a ladies' swimming-bath, 57 ft. by 29 ft. 6 in., having forty-five dressing-boxes. There are also seven private slipper-baths, with dressing-rooms to accommodate thirteen persons; and nine spray and shower baths. The work has been carried out from drawings and specifications prepared by and under the direct supervision of the Engineer and Chief Superintendent of Baths, Mr. W. R. Court. Messrs. Turner & Moss were the sole contractors for the buildings, and Messrs. Thomas Bradford & Co. contractors for the engineering work.

PROPOSED EXTENSION OF THE ESPLANADE, HELENSBURGH.—The Helensburgh Town Council have made application to the Board of Trade for permission to extend the West Bay Esplanade and to widen the Row-road by constructing a retaining wall below high-water mark from the foot of Sutherland-street to the entrance to Ardencaple Castle, and reclaiming the enclosed strip of foreshore, which will average 40 ft. in width. The Row-road will be widened from Glasgow-street westwards to 32 ft., with an 8-ft. footpath on the north side. A promenade 8 ft. in width will be formed alongside the sea wall, and the space between the promenade and the roadway will be laid out as a grass plot. Opposite Cairndhu House the sea wall is shown curved outwards, so as to form a small park, on which shelters will be placed, with seats facing north and south. The engineers are Messrs. Baptie, Shaw, & Morton, Glasgow.

BANK PREMISES, WORCESTER.—New premises have been erected for the National and Provincial Bank at Worcester. The work has been carried out by Messrs. Bromage & Evans, from the designs of Messrs. Chas. Heathcote & Sons, architects, of London and Manchester. The resident architect, Mr. H. F. Penty, superintended the erection. Both the stone and wood carving was executed by Mr. Maboy, of London.

IMPROVEMENTS AT EDINBURGH CASTLE.—Under the supervision of H.M. Board of Works a number of necessary improvements have been made at Edinburgh Castle. The Esplanade has been partly laid with tar-macadam. The drawbridge has been strengthened, the causeway relaid, and a lot of repointing done to the stonework of the buildings. A tank capable of holding 50,000 gallons of water in order to add to the precautions against fire has been erected, and round it has been built a circular wall of grey stone, so that the tank, which can be seen from Princes-street, does not detract from the amenity of the buildings. Other provision has also been made for dealing with an outbreak of fire. Alterations have also been made in the drainage of the Castle. The old brick or rubble drains were in a bad state, and they have been replaced by an improved type, while the drains from Crown-square and the southern and eastern portions have been remodelled. Crown-square has been levelled, and improvements have been made in the officers' mess and the military hospital. The old prison block is to be converted into a central bath-house.

NEW CITY WORKHOUSE.—At their meeting on Tuesday the City Board of Guardians adopted the revised plans for the proposed new City workhouse and infirmary, the original scheme having been amended to meet certain suggestions made by the Local Government Board. The drawings of the imbecile block and the married couples' quarters were presented separately, in consequence of a suggestion from Whitehall that their erection should be deferred for the present. Provision has been made for constructing the open corridors of iron columns instead of brickwork, while the thickness of the walls has been reduced. Mr. A. E. Pridmore prepared the plans.

RAILWAY SERVANTS' ORPHANAGE, WOKING.—The London and South Western Railway Servants' Orphanage is shortly to be transferred from Clapham to a new building at Woking. The new building stands on a site of about 7½ acres, and will be constructed of red brick, with stone dressings and tiled roof. The centre block will include a dining hall, 50 ft. by 30 ft., a kitchen, 25 ft. by 26 ft., a servants' hall, and the usual domestic offices, with detached laundry in the rear, connected with the main structure by a covered corridor. The ground floor of the

remainder of the building will comprise entrance hall, board room, master's sitting-room, store rooms, etc., together with separate class-rooms, and workrooms for girls and boys, and all necessary lavatory and other accommodation. Five stone staircases will lead to the first floor, where dormitories, master's and servants' bedrooms and ample bath-room accommodation will be provided. On the second floor there will be further dormitories and separate infirmaries, with additional accommodation for the staff. Each infirmary will be self-contained, with nurse's room, bath-room, etc. Caretaker's rooms and stores will complete the accommodation. Altogether the dormitories will number six, each with twenty-five beds. The flooring throughout will be wood block on concrete, the corridors will be tiled, and landings and staircases will be of stone. For heating, a low-pressure hot-water system will be installed, with a separate apparatus for supplying the baths during those months when heating of the building is not required. Electricity will be the artificial lighting medium. The building provides accommodation for 150 children. Mr. W. E. Trevena, of South Farnborough, is the architect of the work, and Messrs. E. C. Hughes, of Wokingham, the builders, the amount of their contract being 19,129*l.*

Sanitary and Engineering News.

NEW RAILWAY TO STRATFORD.—It is expected that the new line of railway between Tyseley and Beoley will be open for goods traffic in October. The engineering difficulties encountered by the contractors have not, according to the *Birmingham Post*, been great. There is only one tunnel of any importance, and that is at Wood End, Tanworth. This is 180 yds. long, and is approached by a cutting 50 ft. deep on either side, extending for a quarter of a mile towards Birmingham and half a mile on the Stratford side. The station at Tanworth is not yet finished, but it will probably be ready in six weeks. Earlswood Station is practically finished, and the new station at Henley is well advanced. The latter is about half a mile from the terminus of the branch line from Lapworth to Henley. A loop line, passing under the Stratford-road, connects the new line with this branch. The railway between Beoley and Stratford has been widened so that the new route can be used for the principal trains to South Wales. It will also relieve the main line to London of much of the local traffic, and this, in conjunction with the new line between Ashendon and Aynhoe, and the improvements at Snow Hill and Small Heath, will enable the Great Western Railway to give a much improved service between Birmingham and London. Near Tyseley Station new engine-sheds are now being built. Specifications have also been prepared for a carriage-cleaning and repairing depôt to be erected near the embankment of the main line, between Tyseley and Small Heath stations. Messrs. Henry Lovatt, Ltd., of Wolverhampton, are at present engaged in levelling the site. The erection of the engine depôt was commenced eight months ago, and the buildings are to be complete before Christmas. Mr. Thomas Rowbotham, of Small Heath, is building the sheds, under the direction of Mr. Armstrong, the company's engineer. The Great Western Railway supply all the ironwork themselves, and they will provide their own turntables, overhead travellers, and other machinery. The builder's work will probably cost about 50,000*l.* The main building is already roofed, and is 360 ft. by 246 ft. There is also a lifting shop, 197 ft. by 112 ft., and a carpenters' shop, 80 ft. by 60 ft. The sheds will accommodate about 100 engines at once. The new railway joins the main line just beyond Tyseley Station. About a mile further along a bridge is now being constructed to carry an extension of Westfield Bridge. All the other new bridges—there are seventy in the eighteen miles—have been finished. The number of men employed on the line has been considerably reduced since the excavating and embanking ceased. A year ago nearly 2,000 navvies were engaged; now there are only about 700 men engaged in laying the permanent way and completing the stations.

MEDICAL OFFICER OF HEALTH AND BASEMENT WORKROOMS.—Dr. Parkes, Medical Officer of Health for Chelsea, in his annual report just circulated, says—

"I am of opinion that regulations should be made by the Secretary of State for the Home Department prohibiting the use of underground rooms for workshops unless they complied with certain conditions. If such regulations were in force architects in designing new buildings for use as shops on the ground floor and residential flats or sets of chambers on the upper floors would cause the underground rooms to conform with the regulations, so that the shops and basements might be let at the full rental value. I would suggest that the regulations to be framed should require (1) a certain proportion of glazed fanlight area (above the street level) according to the floor surface of the basement room, a certain proportion of this fanlight area to be made to open for ventilation; (2) that no room should be used as a workroom which has not some means of through ventilation, either by a window, or through a door and adjoining room with window, to the back area or courtyard; (3) that the water-closet should not be in a vault under the street ventilating directly into the workroom, or into an area which is only top-lighted, without means of ventilation, and which either is part of the wookroom or has a window from the workroom opening into it; (4) that the watercloset should not open directly or be ventilated into an underground workroom; (5) that there should be an open fireplace and flue in every basement workroom; or, if a gas stove is to be used, a proper flue should be provided to carry off the products of combustion. It probably would not be possible to make existing underground workshops comply at once with the regulations to be framed; but it might be feasible to apply the regulations to existing workshops after a certain period, in the same manner as the Factory and Workshops Act Sections were made to apply to underground bakehouses after a certain period, which allowed owners and occupiers to make the necessary alterations after due notice."

HOUSING AND SANITATION IN BETHNAL GREEN.—The annual report of the Chief Sanitary Inspector of Bethnal Green (Mr. John Foot), which has just been issued, states that for several years past inspection has been made of different areas more than ripe and suitable on every ground for dealing with under-housing schemes; but for some reason the London County Council appear to rest quite content with having dealt with the Boundary-street area some years ago, entirely regardless of the fact that it would have taken at least four other such schemes to have brought the borough up to anything approaching a modern state as regards housing accommodation for the working classes. As regards the question of drainage, no attempt at any amendment of the law has been made, consequently the "glorious uncertainty" of what legally constitutes a public sewer or a private drain remains as before. The result is that, in addition to unavoidable litigation from time to time, the ratepayers are still burdened with the cost of repairing and maintaining "private drains" as "public sewers." Property owners are still being relieved from their just and proper liabilities at the expense of the rates to the extent of some thousands of pounds per annum. With respect to drainage by-laws, the same wearisome story of ineffective legislation has to be repeated. At the close of last year the Borough Council engaged in a series of legal proceedings, endeavouring to enforce a code of by-laws made by the London County Council in relation to private drainage works carried out by owners of property. These proceedings resulted in the dismissal of all the summonses with substantial costs against the Borough Council, and the resultant position is that, so far as all existing drains are concerned, these by-laws are inapplicable, and can be evaded with the greatest possible ease. In effect they are non-existent so far as the drains of old houses are concerned. All the particulars were reported to the London County Council, who were asked to take the necessary measures to amend their own by-laws, but nothing whatever has been done.

DRAINAGE WORKS IN HAMPSTEAD.—Dr. McCleary, the Medical Officer of Health for Hampstead, says in his annual report just circulated that the by-laws of the London County Council that require that plans and written particulars of drainage construction and alteration shall be deposited with the sanitary authority came into operation in August, 1903. From that date to the end of 1906 Hampstead Council approved of 220 plans for the drainage of new buildings, and 1,787 plans for alterations, etc., to drains of existing premises. During the past year 746 notices of drainage reconstruction or alteration were received, and in 578 cases the work necessitated the deposit of plans and written particulars. In 389 of these latter cases the work could not be delayed until the Council's approval of the plans had been received, and the prescribed "urgency" notice was therefore submitted by the builders, and the plans, etc., deposited at a later date. Of the 578 notices of drainage alterations, etc., requiring the deposit of plans, 309 related to work that involved the entire reconstruction of the drainage system. In 313 of the 578 drainage cases the work was carried out voluntarily, the number of instances in which voluntary complete reconstruction was carried out being 134. The voluntary work was chiefly done in connexion with the larger houses in Hampstead, and in many cases the voluntary drainage reconstructions were of a very extensive character. The supervision of work of this kind occupies much of the inspector's time, and it is partly for this reason that it is found impossible to carry out a systematic house-to-house inspection. The defective state of the law relating to combined drainage did not inflict any considerable loss on the Hampstead ratepayers during the year. Combined drains are of two kinds—either they are "drains" repairable by the owners of the property, or they are "sewers" repairable by the ratepayers. But whether a combined drain is a "drain" or a "sewer" does not depend upon any matter of sanitation, but on a legal technicality that often depends on some purely accidental circumstance, such as the inaccuracy of a drawing, etc. The effect of the law is that every year the ratepayers of London are obliged to provide a large sum—in some districts amounting to a penny rate—for the repair of drains which by an extraordinary legal technicality have become "sewers." The defects of the existing law relating to combined drainage have been pointed out again and again, and it is remarkable that no steps are taken to remedy what is undoubtedly a gross injustice to London ratepayers. During 1906, however, only one successful claim was made in Hampstead, and this was settled by the payment by the Council of 18*l.* Only one of the combined drainage cases that occurred during the year involved legal proceedings. The circumstances in this case were somewhat remarkable. In December, 1905, the drains of the house, No. 22, ————road, were found to be defective. Intimation and statutory notices were served upon the owner, who gave an order to reconstruct the drains to Mr. X., who built the houses in 1893, and who still carries on the business of a builder. When the work was completed the owners claimed to be reimbursed the sum of 38*l.*, alleging that the drain was a "sewer," inasmuch as the rain water from the roofs of Nos. 18 and 20 drained down a rain-water pipe which discharged over a gully in the rear of No. 22. Reference was then made to the drainage plans deposited by the builder, and duly approved by the Vestry in June, 1893. These plans showed each house to be drained separately. As the case presented several difficult points, the opinion of counsel was taken, who advised (1) that the claim should be resisted on the ground that the owner could not take advantage of the wrongful act of his predecessor in title; that (2) notice should be served on the original builder to alter the drains in accordance with the plans; and that (3) failing compliance, the Council should carry out the work and charge him with the cost. The claim was accordingly repudiated by the Council, and nothing has since been heard of it. Notices were served on Mr. X to alter the drains of the three houses in accordance with the original plans. Nothing being done to comply with the notices the work was carried out by the Borough Engineer, and a bill for the expenses was sent to Mr. X. This not being paid, the Council took proceedings to recover the cost of the work, and were successful.

Foreign.

GERMANY.—The regulations for the new forest churchyard to be formed near Munich are drawn up with a view to securing a maximum of orderliness and beauty. The monuments are to be limited in size and to be of such a character as not to clash with their sylvan surroundings. They are to be grouped according to their size and material; wood-carvers, smiths, and founders are to be encouraged to turn their art to account in this class of work; inscriptions are to be decorative, and therefore carefully arranged, and not carried out in black lettering or in crude colours; no inscription printed on paper is permissible, neither are flowers to be planted in fanciful beds. Only wild flowers—mosses, ivy, and such like—are allowed on graves.——The new St. Hubert's fountain, Munich, forms part of the monument in course of erection to the Bavarian Prince Regent. It was designed by the sculptor Adolf von Hildebrand, and the architect Karl Sattler. The fountain is in the form of a pavilion; in the middle is an oval basin, surrounded by eight columns, which bear a cupola pierced by windows and surmounted by the kneeling figure of St. Hubert. The basin is surrounded by a vaulted way, which widens at the four angles into niches ornamented with figures and water-spouts. The central feature of the whole design is the bronze statue of St. Hubert's stag, which stands on a marble pedestal in the middle of the basin, and is brilliantly lit by the openings in the cupola.

AUSTRIA.—The new general hospital, Vienna, to be built on the smallest possible area which will not allow of extension, is to be provided with gardens on the roof. Playgrounds for children have already been provided in Vienna on the roofs of the new large tenements designed by Messrs. Ornstein & Fuchsik.——In the course of the autumn the Municipality of Vienna will raise a sepulchral monument to the memory of the sculptor Fernkorn, the late director of the Royal Foundry in Vienna. The monument by the Viennese sculptor Josef Bayer is an over life-size half-figure of Fernkorn in relief, while the background is covered with his most important works in slight relief.——A monument is shortly to be erected in Innsbruck to the memory of Adolf Pichler, the celebrated Tyrolean poet and naturalist. The bronze statue modelled by the Academic sculptor Edmund Klotz is 3 metres high, and stands on a pedestal of Untersberg marble.——The addition to the Austrian Museum of Art and Industry, which has been so long contemplated, has at last been put in hand. The building designed by Ludwig Baumann adjoins Ferstel's Museum buildings, and will cost 1,100,000 francs, covering an area of 2,400 square metres.

SOUTH AFRICA.—Extensive operations have been carried out by the Durban Corporation on the Back Beach during the past month, a hard road of about 400 yds. having been constructed along the sea front, also a fountain and band-stand erected, a miniature lake dug out, a water-chute into the lake; also a part of the sea has been fenced off by a pier for safe bathing (a requirement Durban has been needing for a long time).——The building of the Queen Victoria Maternity Home in Johannesburg is now completed; the hospital is the finest of its kind in South Africa; special attention has been paid to sanitation; it accommodates seventy patients. Messrs. Dunbar & Co. are responsible for the building to plans by Mr. Wilson, at a contract price of 20,000*l.*——A new bridge is being built over Kowie River, Port Alfred; reinforced concrete is being used; the length will be 285 ft. in nine spans, divided by piers built of concrete, each pier resting on three 15-in. square concrete piles, which will be driven down by a 2-ton pile-driver. The contractors are Messrs. Knight & Volkestad, to plans by the Public Works Department.——Messrs. Eddy Bros. have secured the contract for the new gaol at De Aar, the price being 2,825*l.*, to plans by the Public Works Department.

Miscellaneous.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—The practice of the late Mr. W. A. Waddington, architect, of Mansfield Chambers, St. Ann's-square, Manchester, has been taken over by two of his former assistants, Mr. W. A. Quarmby and Mr. F. Fell, who will carry it on at the same address under the former style of "W. Waddington & Son."——Mr. Edward H. Bruton, architect, 119, Queen-street, Cardiff, has taken into partnership Mr. F. Burwell Foster, architect, of Weston-super-Mare, and from this date the practice will be carried on under the names of Bruton & Foster at the above address.

SALE OF LAND, LLANDRINDOD WELLS.—265*l.* per acre for vacant land in the hills of Central Wales is the average result of Messrs. Knight, Frank, & Rutley's sale at Llandrindod Wells on Tuesday, when the Middleton Evans estates were offered in the Victoria Hall. In addition to local buyers, many attended from London, Swansea, Cardiff, etc. The whole property, which includes the Pump House Hotel, was first offered in one lot and ultimately withdrawn at 105,000*l.* The available building land was then put up in lots, prices for which yielded the above-mentioned result.

ST. MARTIN-IN-THE-FIELDS.—The erection of staging and seats in the churchyard and in the portico of the church for the Coronation procession yielded a profit of 3,750*l.* to the vicar, the late Rev. J. F. Kitto. Out of that sum the vicar apportioned certain amounts for the improvement of the church and organ and a sum of 500*l.* for street decorations in the City of Westminster. A balance of 1,500*l.* yet remains after the payment of costs, by the vicar's wish, to the solicitors of the parish in respect of recent legal proceedings. The litigation arose out of a claim unsuccessfully preferred by the City of Westminster to the parish vestry and portion of the graveyard, whereof a report was published in our columns. An order was made on August 2 by Dr. Tristram, K.C., Chancellor of the diocese, that the balance of 1,500*l.*, less expenses, be divided equally between Mrs. Kitto and the vicar and churchwardens.

EDGWARE PARISH CHURCH.—A faculty will be issued from the Consistory Court to authorise the removal of human remains from beneath the church and their reinterment in the new graveyard, as directed by a recent Order in Council; meanwhile the church will be closed. It is found that a series of brick graves, covered with large flagstones, are filled with water, to a depth of from 4 ft. to 6 ft., in which some of the coffins are floating. Steps are about to be taken, under the superintendence of the Medical Officer of Health, Hendon Rural District, to fill in with hard core the spaces left by the removal of the remains and of the impregnated soil, to properly drain the entire ground underneath the edifice, and to cover the surface with concrete laid to a thickness of not less than 6 in. The body of the church was rebuilt of brick in 1763, and the interior was twice restored in the course of the earlier half of last century.

HENDON PARISH CHURCH.—We read that the tower of the Parish Church of St. Mary, Hendon, evinces signs of decay, and that, as a precautionary measure, the ringing of the bells has been just discontinued. The church stands upon an eminence—the "high hill"—rising from the valley of the Brent, and overlooking the prospect towards Edgware and Stanmore, with Elstree in the distance. The edifice is mainly after the Decorated and Perpendicular styles, with some vestiges of the earlier period; the font is, reputedly, Norman. The embattled tower forms a conspicuous landmark as seen from the northern parts of the county. Amongst the many monuments is one by Flaxman to members of the Colmore family, of Warwickshire.

ARCHITECTS AND PUBLIC BODIES.—A disagreement has arisen, according to the *Yorkshire Post*, in connexion with the erection of a new secondary school for boys and girls at Castleford, under the scheme of the West Riding Education Committee. Architects were publicly invited to submit plans in competition, and some thirty-eight sets were sent in. Mr. Walter S. Brierley, of York, was appointed assessor to decide which of these was the most likely to serve the purpose required. He awarded the first premium to Messrs. Robinson & Jones, of Albion-street, Leeds; but it would appear that, after consultation with the West Riding officials, the work was given to Mr. W. S. Braithwaite, another Leeds architect. The Castleford District Council, who will, of course, have to find a large portion of the money for the new school, held a special meeting on the 15th ult. Mr. C. T. Lightley presided, in the absence of the Chairman. Mr. Braithwaite had been invited to attend the Council meeting, but he respectfully declined, pointing out that he had been duly appointed by the governors, and had had several consultations with them, while his plans were now in the possession of the West Riding Education Committee. The question arose whether Mr. Percy Robinson, whose firm's plans were awarded the first premium, and who was in attendance, should be admitted. After some discussion the Council acceded to the request. Mr. T. Gill entered into a long statement to show that Mr. Braithwaite's plans were the best. His point was that under the conditions set forth the governors had a right to exercise their own judgment, even if the assessor gave Messrs. Robinson & Jones the first premium. The governors declared that they had acted fairly and squarely, and had had no personal ends to serve. Alderman Hartley asked Mr. Gill if the County Council insisted on the provision of baths and gymnasia in the new school? Mr. Gill: I don't know; but they approved of the conditions. Mr. W. B. Robinson elicited that the local authorities of Whitwood, Allerton-Bywater, and Glass Houghton, contributories to the new school, had passed resolutions against the inclusion of baths. "Have you," asked Mr. Robinson, "eliminated baths from the scheme?" Mr. Gill: No. Mr. Robinson: Isn't it a fact that Mr. Braithwaite is actually proceeding with the work? Mr. Gill replied that he did not know. Mr. Robinson added that in giving the work to Mr. Braithwaite the governors had actually violated their own conditions, but Mr. Gill replied that this was not so. Mr. Percy Robinson, at the invitation of the Chairman, addressed the Council. The question, he remarked, was not one which affected his firm only, but architects as a whole. They entered the competition in good faith, expecting that if the award of the assessor was in their favour they would be selected to carry out the work. In the present case, he added, experts considered a most unusual course had been adopted, and professional opinion was distinctly on their side. After a protracted discussion, the Council passed a resolution expressing "strong dissatisfaction" with their representatives, and requesting the whole five to resign their positions on the governing body.

A DREDGER FOR THE MERSEY.—The Tranmere Bay Development Company have contracted with the Mersey Docks and Harbour Board to construct a huge suction dredger for use in increasing and maintaining the depths of water on the bar and in the channels at the river's mouth. Mr. Anthony G. Lyster, Engineer-in-Chief to the Board, prepared the designs and specification of the twin-screw vessel measuring 479 ft. by 69 ft., and 30 ft. 6 in. in depth, with a capacity for 10,000 tons of sand in the hoppers, and pumps which will load her with that amount in fifty minutes from a depth of 70 ft. The dredger, which greatly exceeds in power and capacity any present suction dredger belonging to the board, will be fitted with four sets of pumps and engines, and four suction pipes having an internal diameter of 42 in. It is calculated that nearly 105 million tons have been dredged from the sea channels during the past seven years, with the result that in Queen's Channel a minimum depth of 28 ft. at low water of spring tides is almost uniformly secured.

HARVARD CHAPEL, SOUTHWARK CATHEDRAL.—The chapel which was dedicated a few days ago to the memory of John Harvard is a substitution for the chapel of St. John, wherein the parish vestry, of which Harvard's father was a member, used to meet. The chapel was subsequently used as a debtors' court. The recent alterations, together with the new vestries, have been carried out under the directions and superintendence of Sir Arthur Blomfield & Son. The stained-glass window, by Mr. La Farge, after a design by Mr. C. F. McKim, is a gift (1905) of Mr. Choate, formerly American Ambassador to the Court of St. James's. John Harvard, founder of the University at Cambridge, near Boston, U.S.A., was baptised in what was then the parish church of St. Saviour, on November 29, 1608.

ORDNANCE SURVEY.—In his annual report for 1906–7 Colonel Hellard, Director-General of the Survey, states that the 5 ft. to a mile survey of London, which was revised in 1900–5, is in course of being extended so as to embrace the entire county of London for the purposes of land registry. The 1 in. to two miles map for the whole of England and Wales is now available, and maps to the scales of 1 in. to four, ten, and sixteen miles are now completed for the whole of the United Kingdom. The 1 in. to a mile maps, which are revised in the field independently from those to the larger scales, show no part of England and Wales as unrevised for longer than fifteen years. The total sales during the twelve months under review yielded 22,852*l.* net, being a net increase of 952*l.*, as compared with the yield in the last preceding period.

RUSKIN COLLEGE, OXFORD.—Steps are being taken for the erection, at a computed cost of 20,000*l.*, of new buildings for the Ruskin College, upon the site of the temporary premises near Worcester College, for the accommodation of 100 students. The present number of students in residence is fifty-two, of whom twenty-seven are miners and engineers. Concurrently with an increase of the staff, which has now become necessary, Professor Lees Smith, of University College, Bristol, has been elected director of studies and chairman of the executive committee, and is succeeded as vice-principal by Mr. Charles S. Buxton, of Balliol College.

TOWN HALL, MARYLEBONE.—Of the various sites for the proposed Borough Hall which have been suggested to the New Buildings Committee, the most suitable appears to be that of the Girls' Charity School in Marylebone-road (nearly opposite the parish church) which, as we recently announced, has been vacated by the migration of the school to Ealing. The old "Court House" at the south end of Marylebone-lane is quite inadequate for existing municipal requirements, and outside accommodation is provided for the departments of electricity and public health.

MEMORIAL TO THE LATE MR. JOHN FEENEY.—A tablet has been placed in the church of St. John the Baptist at Berkswell in memory of the late Mr. John Feeney, by the combined staffs of the Birmingham *Daily Post* and *Mail*. The tablet, which occupies a position in the south wall of the chancel, was designed by Mr. Philip Chatwin, and was erected by Messrs. Hart, Son, Peard, & Co., of Birmingham. It is mounted on a solid block of marble, and is of cast bronze.

CANONBURY TOWER, ISLINGTON.—The upper portion—some 6 ft.—and the chimney stacks of this interesting old building are being rebuilt by the Marquis of Northampton, who intends to adapt it for purposes of a ladies' club for his tenants in the neighbourhood. Great care will be taken to preserve, as far as is possible, the pristine features of the fabric, and the sound old red bricks will be used as refacing of the new work. A grant of 1253 confirms possession of the manor of Canonbury in the canons of St. Bartholomew-the-Great, to whom it had been given by Ralph de Berners, who was lord of the manors of Barnsbury and Islington. Bolton (*ob.* 1532), last prior but one of St. Bartholomew's, rebuilt the manor-house which, having reverted on two or three occasions to the Crown, was sold in 1570 by Thomas, Lord Wentworth, to the "rich Sir John Spencer," of Crosby Place, Bishopsgate-street. His daughter and heiress Eliza brought the property in marriage, 1594, to William, second Baron Compton, advanced, 1618, Earl of Northampton, and ancestor of the present owner. There is a tradition that she eloped with him from Canonbury Tower in a baker's panyer. The tower, 58 ft. high and 17 ft. square at base, was built, it is said, by Sir John Spencer. The place can boast of many famous occupants, including William, third Earl of Denbigh, who died there in 1685; Ephraim Chambers, compiler of the first cyclopædia, who died there in May, 1740, and was buried in the cloisters of Westminster Abbey; S. Humphreys, the musician; John Newbery, of St. Paul's-churchyard, who, it seems, held the lease; his son-in-law Christopher Smart, and at intervals in 1763–6 Oliver Goldsmith, in the oak-panelled room, since altered and subdivided, on the first floor. Goldsmith there composed portions of "The Traveller" and wrote some of the children's little books for Newbery's Liliputian Library. Some place the scene of his rescue by Dr. Johnson from arrest, followed by the publication of "The Vicar of Wakefield," at Canonbury, but the ascription is doubtful. A few vestiges of Prior Bolton's work, in the form of chimney pieces, carving, and plaster decoration, with his rebus of a tun and bolt have remained to our own time in Nos. 5–7, Canonbury-place, and also, at the rear of a house in Alwyne-villas, his summer-house, of red brick and octagonal on plan, to which an upper story was latterly added. The manor park and garden, about four acres in extent, were taken for the Canonbury tavern, known in 1785–1808 as Mrs. Sutton's, with tea gardens and a bowling-green. Most of the houses on the manor site were built in the closing years of the XVIIIth century by John Dawes,

of Highbury, a stockbroker. Canonbury-square was laid out some twenty-five years afterwards. A good woodcut of the tower as seen from the New River, on the north-east, will be found in Hone's "Every Day Book," vol. i., 1826.

READING-ROOM, BRITISH MUSEUM. — The authorities anticipate that the reading-room will be re-opened in the first or second week of November. Messrs. Warings & Gillows are carrying out a scheme of decoration in, for the greater part, ivory-white and gold; the balconies are gilded, and the lower wall is being painted in a pale grey-brown colour. The size of the room—140 ft. by 106 ft. in height—has necessitated the use of a large amount of scaffolding, and upwards of 12,000 poles of different lengths have been fixed together.

COUNTY ARCHITECT'S FEE.—At a recent meeting of the Lancashire Asylums Board at Preston, the Finance Committee recommended that 500*l.* should be paid to Mr. H. Littler, County Architect, for his services in connexion with the selection of a new asylum site. Alderman Jenkins said Mr. Littler had visited and reported on thirty-one sites. Mr. Short, Liverpool, said that the appointment of Mr. Littler as architect for the new asylum was remuneration for the work, and Alderman Paul, Liverpool, said that of the sites visited the worst one had been chosen. He moved that the amount be 100*l.* Alderman Greenwood said that the architect had no commission and no regular salary from the Board. He thought the money well earned. The Chairman said Mr. Littler had been engaged on this work for about five years, and the fact that he had become architect for the new asylum ought not to effect the amount paid for his previous work. As to the site, they must not blame Mr. Littler, but the Board. As architect Mr. Littler was only being paid 4 per cent. instead of the usual 5 per cent. Alderman Jenkins added that Mr. Littler's assistants would probably take one half of the money. Mr. Kinch, C.C., said that Mr. Littler's connexion with the County Council was an advantage to the Board, and was not a reason why he should not be paid. The amendment was lost by sixteen votes to nineteen, and Mr. Short immediately moved that the sum be 250*l.* The Clerk (Mr. Harcourt Clare) pointed out that the Board was under a legal as well as a moral obligation to pay Mr. Littler for his services. The amendment was then put and carried by nineteen votes to seventeen.

THIRD INTERNATIONAL DRAWING CONGRESS.—An international congress for the development of drawing and art teaching will be held in London during the first week of August, 1908. Two such congresses have previously been held, the first in Paris in 1900, the second in Berne, in 1904. The congress, it is expected, will bring together representatives of drawing and art teaching from all parts of the globe, and in connexion therewith a large and comprehensive exhibition is proposed, which will show the methods of art teaching pursued in the various countries of the world. Applications for space and inquiries have already been received from Germany, France, Russia, Italy, Austria, United States, Egypt, India, New Zealand, Newfoundland, and many other places. The organising secretary is Mr. C. M. Matthews, who will be glad to give any further information. Inquiries should be addressed to him at the office of the Congress, 151, Cannon-street, London, E.C.

WHITECHAPEL HAY AND STRAW MARKET.—In the suit of Gingell, Son, & Foskett (Ltd.) *v.* Stepney Borough Council, which has just been heard in the Court of Appeal, Lord Justice Vaughan Williams and Lord Justice Buckley dismissed the appeal from a judgment of Mr. Justice Swinfen Eady, Lord Justice Fletcher Moulton dissenting. The action was brought as a test case to determine in what streets the hay and straw market could be legally held, and to ascertain whether the Borough Council who, as successors to the parish trustees, control the market, which belongs to the lord of the Stebonheath, or Stepney, manor, are empowered to limit the market by their regulations of May 14, 1904. Under those rules the Council take powers to restrict the market to High-street, Whitechapel, and to Buckle, Plough, and Colchester streets—which do not adjoin High-street—when High-street is fully occupied or impeded by traffic. The plaintiff company, as salesmen, claim a right to use High-street, together with parts of Leman (formerly Red Lion) street, Commercial-street, and Commercial-road. The market is an ancient one, without metes and bounds, and the area of the market franchise extends to the whole parish within the manor. The Court were of opinion that the market is *in sive juxta* High-street, and that whereas salesmen have no right to place their carts where they like, market rights do exist in Commercial-road and Leman and Commercial streets which adjoin the High-street, and have been laid out at intervals during the past seventy years. Mr. Horace Avory, K.C., with Mr. W. Frampton and Mr. A. E. Woodgate appeared for the plaintiffs: Mr. MacMorran, K.C., and Mr. Courthope-Munroe were counsel for the defendants.

MUNICIPAL IMPROVEMENTS.—The Scarborough Harbour Commissioners have resolved to expend a sum of 15,000*l.* upon a scheme which comprises an extension and deepening of the harbour, in aid of which the Treasury will, it is expected, make a grant of 4,750*l.* In the course of the current month the Local Government Board will hold inquiries concerning a large number of projects, and their attendant expenditure, in the provinces, of which the more important are those proposed by the local authorities of Warrington—street improvements and electricity works and plant (47,376*l.*); Kingswood—sewerage and sewage disposal (10,000*l.*); Berwick-on-Tweed—water supply and plant (20,000*l.*); Chester—street improvements and underground conveniences (8,200*l.*); Stockport—recreation and burial grounds (7,540*l.*); Darlington—street improvements (6,797*l.*); Southampton—refuse destructor and recreation ground (1,710*l.*); and Bishop's Stortford—sewerage and castle grounds (2,062*l.*). Similar inquiries were held in the course of August in respect of street improvements, etc., in Nantwich (5,550*l.*) and Bristol (6,688*l.*); at Portsmouth — enlargement of the asylum (24,000*l.*); Leeds—Corporation Offices (7,644*l.*); Aberavon—sea defence and new market (5,040*l.*); and Christchurch—sewerage and sewage disposal (29,675*l.*).

Legal.

ACTION AGAINST THE LONDON COUNTY COUNCIL.

THE case of Beyfus *v.* the London County Council came before Mr. Justice Pickford in the Vacation Court on Wednesday last.

Mr. Bramwell Davis, K.C., for the plaintiff, said that in this case his Lordship had granted an interim injunction over that day to restrain the defendants from proceeding with the erection of a certain building pending the trial or further order. Mr. Tanner, who represented the defendants, agreed that that injunction should be continued until the trial, but he desired a speedy trial and that pleadings should be delivered notwithstanding the Long Vacation.

Mr. Tanner said that it was not a case which could be properly tried at that stage.

His Lordship: Do you want pleadings?

Mr. Tanner: Yes. I have a case independently of obstruction.

Mr. Bramwell Davis: I also want an order for discovery.

Mr. Tanner: I do not object to that. I want until October 10 to deliver the defence, because the defence is not only on questions of fact but also on the statutes.

His Lordship made an order in the terms agreed upon by counsel, made the costs of the present motion costs in the action, and directed that the plaintiff's undertaking in damages should be continued until the trial of the action.

Patents of the Week.

APPLICATIONS PUBLISHED.*

23,158 of 1906.—J. TAYLOR: *Fire-resisting Doors.*

THIS relates to fire-resisting doors consisting of two or more metal sheets with a layer or layers of asbestos or the like between, and consists in the use of metal sheets so indented or embossed that the expansion which takes place under heat will be taken up within the normal length and width of the door itself by the yielding of the raised portions.

23,945 of 1906.—M. J. ADAMS: *Construction of Urinals.*

This relates to the divisions and form of urinals and the flushing arrangements thereof, and consists in forming the urinal of semi-circular backs, or of flat slabs, or slabs of other suitable form, are placed, as a rule, over or in juxtaposition to a channel which receives the liquid; the divisions used to form screens are so placed that a person may sweep through the channel for cleaning purposes, the divisions being brought forward and away from the backs in such a manner that a space is left between them and the urinal proper.

25,298 of 1906.—C. G. DE SAINT-HUBERT: *Presses for Bricks or the like.*

This relates to a press for bricks and the like wherein the moulds are completely filled with material to be pressed, the material in excess being expelled from the moulds by a supplementary rising movement of the pressing pistons, said excess of material being conducted in the direction of rotation of the mould-drum out of the feed hopper through a free outlet provided at the extremity of said hopper.

25,634 of 1906.—J. S. HOGARTH, M. HOGARTH, and T. DIXON: *Casement Windows.*

This relates to a window having the casement attached to the frame by means of swinging bars, and consists in the construction comprising arms secured rectangularly to said swinging bars, and a bar slidable in a groove in the swinging style of the casement and adapted to lock said arms to the swinging style or release them therefrom.

27,188 of 1906.—A. S. HARLOW: *Flushing Cisterns.*

This relates to a flushing cistern comprising a tank having a stand-pipe cast in or otherwise arranged near the side wall, a bent-over siphon-pipe connected to the top of the stand-pipe, the latter pipe having a quadrant extension or box at its lower end of a width equal to the diameter of the pipe, and a vane or tongue arranged to operate inside the box or casing.

371 of 1907.—F. DICKINSON: *Ladders.*

This relates to ladders, and consists of means for tightening up and strengthening the tubular rungs consisting of a bolt passed through each rung having a head at one end, a screwed portion at the other end, and a nut mounted on the screwed portion, and provided with slots.

4,106 of 1907.—E. C. HODGES: *Building Blocks.*

This relates to a building block of any suitable material having its end faces of concavo-convex shape, its upper inner corner formed with a right-angle shoulder, and its upper outer edge cut away so as to form an inclined face, the lower inner corner forming a fillet complementary to said right-angle shoulder, and the lower outer corner being provided with a flaring flange complementary to said inclined face.

4,189 of 1907.—W. NEWMAN & SONS, LTD., and G. F. NEWMAN: *Means for Opening and Closing Fan-lights, Roof-lights, Trap-doors, and Analogous Openings.*

This relates to means for opening and closing fan-lights, roof-lights, trap-doors and analogous openings, and consists in the employment of a rotatable worm engaging a worm-wheel having an internally screwed or wormed eye or centre, which surrounds a correspondingly screwed or wormed jointed stay-rod, and is adapted by its rotation upon the latter to cause the fan-light, roof-light, or the like, to be opened or closed, said worm and worm-wheel mechanism being carried upon a swinging or rocking carrier adapted to admit of a change of angularity of the said stay-rod when the fan-light or the like is opened or closed.

4,256 of 1907.—J. H. STORM and P. H. VAN HASELEN: *Apparatus for Removing Paint from a Painted Surface.*

This relates to a method of removing paint adhering to wood or metal articles—for example, windows and doors—and is characterised by softening the same through indirect heating without exposing the painted surfaces to be cleaned to the flame, and by the simultaneous scraping of the said surfaces by means of a suitably-heated tool.

4,498 of 1907.—A. THEYSKENS: *Doors.*

This relates to a door, and is characterised by the leaf or leaves being carried by one or two lever-arms in the form of sectors pivoted at the top to the leaves of the door, the arcs of which can extend or develop on a horizontal plane, so that each leaf describes near each extreme position an arc of a circle of large radius or compass, and moves in a straight line between these two arcs.

6,124 of 1907.—H. TUMMES: *Presses for the Manufacture of Fire-bricks.*

This relates to presses for the manufacture of fire-bricks wherein the lid is first released by a cam actuated by the main shaft and then raised by another cam on the said shaft and brought to a position of rest, whilst after removal of the finished brick and refilling of the mould the lid is closed by hand and so again brought into the cycle of action.

6,178 of 1907.—E. P. ALLEN: *Air-valves for Heating Systems.*

This relates to an air-valve for heating systems, comprising a casing having two chambers, one a float-chamber and the other a pressure-chamber, a float in the float-chamber, a communication between the bottom of the float-chamber and the pressure-chamber, said float-chamber being provided with an inlet adapted to be placed in communication with a radiator and with an outlet passage-way, and a valve carried by said float for governing said outlet passage-way, and so arranged with respect to said pressure-chamber that the medium in the passage-way may effect the thermal condition of the contents of the pressure-chamber after it passes the point controlled by the valve.

PATENTS.—*Continued on page* 282.

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

List of Competitions, Contracts, etc.

For some Contracts still open, but not included in this List, see previous issues. Those with an asterisk (*) are advertised in this Number: Competitions, iv.; Contracts, iv. vi. viii. x.; Public Appointments, xviii.; Auction Sales, xxviii.

Certain conditions, beyond those given in the following information, are imposed in some cases, such as: the advertisers do not bind themselves to accept the lowest or any tender; that a fair wages clause shall be observed; that no allowance will be made for tenders; and that deposits are returned on receipt of a bonâ-fide tender unless stated to the contrary.

The date given at the commencement of each paragraph is the latest date when the tender, or the names of those willing to submit tenders, may be sent in.

***** It must be understood that the following paragraphs are printed as news, and not as advertisements: and that while every endeavour is made to ensure accuracy, we cannot be responsible for errors that *may* occur.**

Competition.

OCTOBER 15.—**Cemaes.**—DRAINAGE.—The Twrcelyn R.D.C. invite plans and specifications, in competition, for a drainage scheme for the village of Cemaes. Although a drainage scheme for the whole of the village is asked for, it is understood that that portion of the scheme relating to the developed portion of the village only will be proceeded with. Competitors are requested to state the remuneration required by them for the plans, specifications, and supervision of the work. Mr. Thomas Hughes, Clerk to the Twrcelyn R.D.C., Brynaethwy, Menai Bridge.

Contracts.

BUILDING.

SEPTEMBER 8.—**Pontyclun.**—VILLAS.—For the erection of two villas at Pontyclun for Messrs W. H. and A. Eastmond, Pontyclun. Plans and specifications may be seen at the residence of the above.

SEPTEMBER 9.—**Culross.**—TOWN HALL IMPROVEMENTS.—Estimates are wanted for mason, joiner, plumber, plaster, and slater works required in carrying out improvements on the property of the Town Hall, Culross. Plans and specifications may be seen, and further information obtained, on application to Mr. Andrew Scobie, architect, Dunfermline.

SEPTEMBER 9.—**Diss.**—SCHOOL.—The Governors of Diss Secondary School are desirous of receiving the names of those willing to tender for the erection of a secondary school at Diss. Plans and specification may be inspected at the offices of the architect, Mr. A. Hessell Tiltman, at No. 1, Raymond-buildings, Gray's Inn, W.C., London, from whom also bills of quantities may be obtained on and after September 16, on payment of a deposit of 2*l.* 2s.

SEPTEMBER 9.—**Rochdale.**—WOODEN PAVILION.—Rochdale Corporation invite tenders for the erection of a wooden pavilion, including sundry works in connexion with foundations and plumbing at Broadfield Park Bowling Green. Plans can be seen, and bill of quantities obtained, on application at the office of Mr. S. S. Platt, Borough Surveyor, Town Hall, Rochdale.

SEPTEMBER 10.—**Rochdale.**—BOUNDARY WALL.—Rochdale Corporation invite tenders for the erection of a parpoint boundary wall, with stone dressings, round the former site of Halstead's Foundry. Plans and specifications may be seen, and copies of the quantities and form of tender obtained, at the Borough Surveyor's Office.

SEPTEMBER 11.—**Bargoed.**—SCHOOL ADDITIONS, ETC.—Glamorgan C.C. invite tenders for additions and alterations to the Bargoed (Girls') Council School. Plans and specification may be seen, and copies of the bill of quantities obtained, at the Bargoed Police-station, and at Glamorgan County Offices, Westgate-street, Cardiff.

SEPTEMBER 11.—**Crynant.**—HOUSES.—Tenders are invited for the erection of thirty (or more) houses at Crynant for the Crynant Building Club. Plans and specifications may be seen at the offices of Mr. J. Cook Rees, architect, Neath.

SEPTEMBER 11.—**Port Talbot.**—VILLAS.—Tenders are invited for the erection of ten semi-detached villas at Port Talbot for the Tanygroes Building Club. Plans and specification may be seen, and all particulars obtained, at the office of Mr. Thomas Gibb, architect, Post-office-chambers, Port Talbot.

SEPTEMBER 12.—**Edinburgh.**—BOUNDARY WALLS, ETC.—Estimates are invited for the erection of boundary walls and unclimbable iron fences at Blackford Hill, according to plans and specification, which may be seen at the office of Mr. R. Morham, City Architect, Public Works Office, City Chambers, Edinburgh, where schedules of quantities may also be had on personal application.

SEPTEMBER 14.—**Burley-in-Wharfedale.**—COAL STORE AND COW-HOUSE.—The Scalebor Park Committee of the West Riding C.C. invite tenders for the several works required in the erection of coal store and cow-house at Scalebor Park. Plans may be seen, and bill of quantities obtained, from the Clerk of Works, Scalebor Park, Burley-in-Wharfedale.

SEPTEMBER 14.—**Carlisle.**—SCHOOL.—Tenders (single or whole) are required for the erection of the new St. Patrick's School, Albert-street, Carlisle. Plans and specifications can be seen at the offices of Mr. H. Foxall, architect, 54, Lowther-street, Carlisle.

SEPTEMBER 14.—**Midleton.**—COTTAGE REPAIRS.—Midleton R.D.C. invite tenders for the carrying out of certain repairs to thirteen labourers' cottages in the Electoral Division of Garryvoe, in accordance with specifications which may be seen at the office of Mr. John Stanton, Clerk to the Council, Workhouse, Midleton.

SEPTEMBER 14.—**Wedmore.**—SCHOOL IMPROVEMENTS.—Somerset C.C. Education Committee invite tenders for improvements, alterations, and repairs at the Wedmore Council School. Plans and specification can be seen at the school, and further information obtained from Messrs. Price & Jane, architects, Weston-super-Mare.

* SEPTEMBER 16.—**Coventry.**—BOILER-HOUSE, MORTUARY, ETC.—The Coventry and Warwickshire Hospital Committee invite tenders for proposed laundry, boiler-house, mortuary, etc. For further particulars refer to an advertisement in this issue.

SEPTEMBER 16.—**Newall.**—WORKHOUSE ALTERATIONS.—The Guardians of the Wharfedale Union invite tenders for the mason's, joiner's, plumber's, and painter's work required for alterations to be carried out at their Workhouse at Newall, Otley. Quantities may be obtained upon application at the office of the Guardians' Architect, Mr. J. H. Wall, Manor-square, Otley.

SEPTEMBER 16.—**Wakefield.**—POLICE HEADQUARTERS.—West Riding Standing Joint Committee invites whole tenders only for the erection of divisional headquarters for the West Riding Constabulary at Wakefield. Plans may be seen, and bills of quantities obtained, on application to the office of Mr. J. Vickers-Edwards, County Architect, County Hall, Wakefield. A deposit of 1*l.* is required. Cheques, etc., must be made payable to the West Riding Treasurer, and sent to him direct at the County Hall, Wakefield.

SEPTEMBER 17.—**Chilton Buildings.**—SCHOOL ALTERATIONS, ETC.—Durham C.C. invite sole tenders for alterations and additions to the Council School at Chilton Buildings, near Ferryhill. Plans, specification, and general conditions of contract may be seen, and bills of quantities obtained, at the office of Mr. C. A. Clayton Greene, architect and surveyor, 18, Norfolk-street, Sunderland.

SEPTEMBER 17.—**Kingussie.**—VILLA.—Estimates are invited for the mason, carpenter, slater, plumber, and plasterer works of new villa to be erected on East-terrace. Plans and specifications may be seen with Mr. Alexander Mackenzie, architect.

* SEPTEMBER 17.—**Walton-on-Thames.**—POST-OFFICE.—The Commissioners of H.M. Works, etc., invite tenders for the erection of a new post-office at Walton-on-Thames. For further particulars see advertisement in this issue.

SEPTEMBER 18.—**Darlington.**—EXTENSION OF PARCELS OFFICE, ETC.—Directors of North-Eastern Railway invite tenders for the extension of the Parcels Office, etc., at Darlington, Bank Top Station. Plans and specification may be seen at the Station-master's Office, Darlington, and quantities and further information obtained upon application to Mr. William Bell, the Company's Architect, at York.

SEPTEMBER 18.—**Dublin.**—LABOURERS' COTTAGES.—South Dublin R.D.C. invite tenders for building fifty-three labourers' cottages. Plans and specifications may be inspected, and tender forms obtained, from the Clerk to the R.D.C., 1, James's-street, Dublin.

SEPTEMBER 18.—**Hull.**—ACCUMULATOR HOUSE AND CLOCK TOWER.—Directors of North-Eastern Railway invite tenders for the erection of an accumulator house and clock tower, Albert Dock, Hull. Plans and specification may be seen, and quantities and further information obtained, on application to Mr. William Bell, the Company's Architect, at York. Duplicate plans may also be seen at the Station-master's Office, Paragon Station, Hull.

* SEPTEMBER 18.—**Leamington Spa.**—POST-OFFICE.—The Commissioners of H.M. Works, etc., invite tenders for the enlargement of the post-office at Leamington Spa. For further particulars see advertisement in this issue.

* SEPTEMBER 18.—**London, S.E.**—UNDERGROUND CONVENIENCE.—The Southwark B.C. invite tenders for an underground convenience for women on the Island at the Elephant Headway. For further particulars refer to an advertisement in this issue.

* SEPTEMBER 18.—**Sutton, etc. (Essex).**—NEW SCHOOLS.—The Essex Education Committee invite tenders for the erection of new schools at Sutton, Thundersley, and Ray'eigh. For further particulars refer to an advertisement in this issue.

* SEPTEMBER 19.—**Sidcup.**—REPAIRS, ETC.—The Guardians of the Greenwich Union invite tenders for reinstating damage caused by fire at the administrative block of the children's homes at Sidcup, Kent. For further particulars refer to an advertisement in this issue.

SEPTEMBER 21.—**Bowdon.**—SHEDS AND BOUNDARY WALL.—Bowdon U.D.C. invite tenders for the erection of sheds and boundary wall for the new town's yard, Bowdon. Plans may be seen at the Council Offices, Bowdon, between hours of 11 to 12 a.m. Bills of specified quantities may be obtained there on deposit of 10s.

SEPTEMBER 21.—**Illogan Highway.**—CHURCH.—Tenders are invited for the erection of the proposed Wesleyan Methodist Church at Illogan Highway, according to plans and specifications which may be seen by appointment at the office of Mr. Sampson Hill, architect, Green-lane, Redruth, from whom all particulars relating to the work may be obtained.

SEPTEMBER 23.—**Oakmere.**—POLICE-STATION ALTERATIONS.—Tenders are required for alterations and additions to the County Police-station at Oakmere, Cheshire. Plans and specifications can be seen at the office of Mr. H. Beswick, County Architect, Chester, on and after September 9, and quantities obtained on deposit of 1*l.*

SEPTEMBER 24.—**Hounslow Heath.**—SCHOOLS.—Heston and Isleworth U.D. Education Committee invite tenders for the erection of new schools at Hounslow Heath. The plans may be inspected at the office of Mr. A. Lancelot Lang, architect, Council House, Hounslow, where also bills of quantities may be obtained, together with specification and form of tender, on and after September 9, 1907, on payment of a deposit of 2*l.* 2s.

* SEPTEMBER 25.—**Watford.**—NEW SCHOOL.—The Hertfordshire C.C. Education Committee invite tenders for the erection and completion of a new school for 960 children. For further particulars refer to an advertisement in this issue.

* SEPTEMBER 26.—**Portland.**—CUSTOMS WATCH HOUSE.—The Commissioners of H.M. Office of Works invite tenders for the erection of a customs watch house at Portland. For further particulars see advertisement in this issue.

OCTOBER 1.—**Feenagh.**—ALTAR.—Designs, specifications, and estimates will be received by the Rev. Thomas Liston, P.P., on or before October 1 for supplying and erecting a marble altar, including foundations, at Feenagh Roman Catholic Church, Co. Limerick. Specifications, conditions, and particulars will be supplied by Mr. James D. Leahy, architect, Newcastle West, on payment of a fee of 1*l.* 1s.

* OCTOBER 9.—**Willesden Green.**—NEW SCHOOL.—The Willesden Education Committee invite tenders for the erection of a school for mentally and physically defective children at Pound-lane, Willesden Green. For further particulars refer to an advertisement in this issue.

* OCTOBER 22.—**Dublin.**—COLLEGE AND WORKSHOPS.—The Commissioners of Public Works in Ireland invite tenders for the erection of college and workshops in Upper Merrion-street, Dublin. For further particulars see advertisement in this issue.

NO DATE.—**Ardsley.**—SCHOOL ALTERATIONS, ETC.—Ardsley (E. and W.) Education Committee invite tenders for alterations to be made at Westerton, Blackgates, and East Ardsley Schools. For specifications and particulars of the work apply to Mr. Alexander Angus, W.R. Education Office, 128, Northgate, Wakefield.

NO DATE.—**Belfast.**—VILLAS.—Estimates are required for executing the brickwork and carpenter and joiners' work (labour only) of semi-detached villas at Ballygomartin-road. Plans and specification may be seen at office of Mr. Frederick W. Shaw, architect, 42, Upper Arthur-street, Belfast.

NO DATE.—**Booker.**—HOSPITAL.—Estimates are invited for a new isolation hospital at Booker for the Wycombe R.D.C. For all particulars apply Mr. Thos. Thurlow, architect, High Wycombe.

NO DATE.—**Llandinam.**—MINISTER'S HOUSE.—New minister's house, at Llandinam, Montgomeryshire. Names to Mr. G. Dickens Lewis, M.S.A., architect, Shrewsbury, who will supply bills of quantities and all necessary particulars.

NO DATE.—**Matlock Bath.**—COTTAGES.—Firms desirous of tendering for erection of two cottages, also for works of alterations and additions to three cottages, to communicate with Miss Pearson, Melbourne House, Temple-road, Matlock Bath.

NO DATE.—**Oakenshaw.**—CONVENIENCES AND BOUNDARY WALL.—Contractors desirous of tendering for mason's, joiner's, and plumber's work in new conveniences and boundary wall at Oakenshaw Woodlands School to apply to Mr. John W. Broughton, Estate Office, Gargrave.

NO DATE.—**Wetherby.**—CHAPEL ADDITIONS.—Tenders are invited for alterations and additions to a chapel near Wetherby, Yorkshire. Drawings and specification have been prepared by Messrs. Blow & Billerey, architects, 9, King's Bench-walk, London, E.C., and may be seen at the offices of Messrs. Bare, Leaning, & Bare, quantity surveyors, 115, High Holborn, London, W.C. A bill of quantities can be obtained from the surveyors on payment of 1*l.* 1s.

ENGINEERING, IRON, AND STEEL.

SEPTEMBER 9.—**Ogmore.**—IRON FENCING.—Ogmore and Garw U.D.C. invite tenders for the supply and delivery at Ogmore Vale Station 700 yds. (or thereabouts) of pillar, tube, and angle iron fencing. Form

of tender and further particulars may be obtained at the Council Offices, Brynmenyn.

SEPTEMBER 11.—**Blaenllynfi.**—HEATING.—Glamorgan C.C. invite tenders for the heating of the Council school at Blaenllynfi. Plans and specification may be obtained from Mr. T. Mansel Franklen, Clerk of the Glamorgan C.C., Glamorgan County Offices, Westgate-street, Cardiff.

SEPTEMBER 13.—**Dublin.**—ELECTRICAL INSTALLATION.—Commissioners of National Education invite tenders for the complete electrical installation at the new residence, Marlborough-street Training College, Glasnevin, Dublin, including gas-engines, producers, battery, wiring, etc. Plans, specifications, conditions of contract can be seen, and forms of tender can be had, at the office of the Engineers, Messrs. Tomlinson & Mills, 39, Fleet-street, Dublin, between the hours of 10 a.m. and 5 p.m. (10 a.m. to 1 p.m. on Saturdays).

SEPTEMBER 14.—**Blaenavon.**—FILTERING TANK, ETC.—Blaenavon U.D.C. invite tenders for construction of filtering tank and laying of a length of 3-in. cast-iron main, including all necessary excavations and jointing. Specifications and drawings may be seen, and forms of tender obtained, with all necessary information, upon application to the Clerk of Works, at the Council Offices, No. 10, Lion-street, Blaenavon, between the hours of 11 a.m. and 12 noon.

SEPTEMBER 16.—**Ware.**—FOOTBRIDGE.—Ware R.D.C. invite tenders for the erection of a footbridge at Waters-place. Form of tender can be obtained at the office of the Surveyor, Mr. H. J. Jackson, Rye-road, Hoddesdon, where plans and details can be seen.

✱ SEPTEMBER 18.—**London, S.E.**—WELL-SINKING.—The Southwark B.C. invite tenders for sinking a well and providing and fixing pumping plant at the Public Baths, Manor-place, Walworth-road, S.E. For further particulars refer to an advertisement in this issue.

SEPTEMBER 19.—**Plymouth.**—CAST-IRON PIPES.—Plymouth Corporation invite tenders for the supply and delivery of about 1,500 tons of 24-in., 20-in., and 18-in. cast-iron pipes and special castings. Specification, form of tender, and other information may be obtained from Mr. Frank Howarth, M.Inst.C.E., Water Engineer, Municipal-buildings, Plymouth, on payment of the sum of 3*l.* 3s.

SEPTEMBER 19.—**Plymouth.**—SLUICE VALVES.—Plymouth Corporation invite tenders for the supply and delivery of sluice valves; also 4-in. double air valves, with strong road surface boxes. Specification, form of tender, and other information may be obtained from Mr. Frank Howarth, M.Inst.C.E., Water Engineer, Municipal-buildings, Plymouth.

SEPTEMBER 25.—**Basford.**—Nottingham Public Baths Committee invite schemes and tenders for the hot water supply, atmospheric heating, and other engineering work required at the new baths, Vernon-road, Basford. Plans may be seen, and particulars obtained, from Mr. Frank B. Lewis, City Architect, Guildhall, Nottingham, on payment of a deposit of 2*l.* 2s.

SEPTEMBER 30.—**Tamworth.**—CAST-IRON PIPES.—Tamworth Joint Sewage Disposal Committee invite tenders for providing and delivering at Tamworth Station 470 tons of cast-iron pipes, 12 in., 15 in., 17 in., 18 in., and 42 in. diameter. Specification and form of tender may be obtained on application to the Engineers, Messrs. F. E. G. Bradshaw & H. J. Clarson, 21, Church-street, Tamworth, upon payment of 1*l.* 1s.

OCTOBER 7.—**Kirkcaldy.**—DOCK GATES AND SWING-BRIDGE.—Corporation of Kirkcaldy invite tenders for the construction and erection, at Kirkcaldy, of a pair of 50-ft. steel dock gates, and a swing-bridge of 50-ft. span. The drawings are exhibited at the offices of Messrs. Hodges & Bennett, 113, Cheapside, London, E.C., from whom copies may be obtained at a cost of 2*l.* 5s., and the specification and tender forms can be obtained free on application to the Town Clerk, Kirkcaldy.

OCTOBER 31.—**Rangoon.**—PUMPING PLANT.—Rangoon Municipality invite sealed tenders for pumping plant, in duplicate, to raise up to a maximum of 10,000 galls. of water per minute to a height, including suction-lift and friction, of 220ft. Full particulars can be obtained on application to Messrs. Ogilvy, Gillanders, & Co., London agents to the Rangoon Municipality, Sun-court, 67, Cornhill, London, E.C., accompanied by a remittance of 10s., which will not be returned.

MISCELLANEOUS.

SEPTEMBER 9.—**Bradford.**—SCHOOL FURNITURE.—Bradford Education Committee invite tenders for the supply of school furniture on forms to be obtained on application at the Education Office, Manor-row, where samples may also be seen.

SEPTEMBER 11.—**Uxbridge.**—IRONMONGERY, ETC.—Uxbridge Guardians invite tenders for the supply of bedsteads, beds and bedding, furniture, earthenware, ironmongery and hardware, and window blinds for the new infirmary and other buildings at the Union Workhouse, Hillingdon East, near Uxbridge. Forms of tender may be obtained from Mr. Charles Woodbridge, Clerk to the Guardians, 38, High-street, Uxbridge, and samples of the various articles required may be seen on application at the Workhouse.

SEPTEMBER 12.—**Rhondda.**—SCAVENGING.—Rhondda U.D.C. invite tenders for the scavenging of their district, in sections, for one year. Specification and form of tender may be obtained at the Surveyor's Department, Public Offices, Pentre, Rhondda.

SEPTEMBER 13.—**Valetta, Malta.**—MANHOLE COVERS.—Tenders are invited by the Receiver-General and Director of Contracts, Valetta, for the supply of manhole covers. Tenders are to be accompanied with a deposit of 30*l.* to be made in the office of the Crown Agents by tenderers residing in Great Britain not having a representative in Malta. Particulars, specification, etc., may be obtained on application to the Crown Agents for the Colonies, Whitehall-gardens, London.

SEPTEMBER 14.—**Palmer's Green, N.**—STEAM ROAD ROLLER.—Southgate U.D.C. invite tenders for the supply of a steam road roller. Specifications, forms of tender, etc., may be obtained on application to Mr. C. G. Lawson, the Council's Surveyor, at the Council Offices, Palmer's Green, N.

SEPTEMBER 14.—**Wrotham.**—EMPTYING OF CESSPOOLS.—Wrotham U.D.C. invite tenders for working the cesspool emptying plant within their district for one year from September 29, 1907, as per specification to be seen at the office of the Surveyor, Mr. F. T. Elliott, Borough Green.

SEPTEMBER 16.—**Bristol.**—PLUMBERS' SUNDRIES, ETC.—Bristol Sanitary and Improvement Committee invite tenders for horse hire, plumbers' sundries, testing and maintaining weighbridges. Specifications and forms of tender may be obtained at the offices of Mr. Thos. Henry Yabbicom, M.Inst.C.E., City Engineer and Surveyor, 63, Queen-square, Bristol.

SEPTEMBER 16.—**Keady.**—SIGNALLING.—Castleblayney, Keady, and Armagh Railway Company Directors invite tenders for the signalling (about fourteen working levers) of the new station at Keady, in accordance with the plan and specification to be seen at the office of Mr. W. H. Mills, Engineer-in-Chief, Great Northern Railway Company (Ireland), Amiens-street Terminus, Dublin.

SEPTEMBER 17.—**Banstead.**—SCAVENGING, ETC.—Epsom R.D.C. invite tenders for the removal of house refuse at Cuddington and scavenging at Banstead. Specifications and forms of contract can be seen on application to Mr. W. T. Wooldridge, Surveyor to the Council, Waterloo-road, Epsom, of whom full information can be obtained.

SEPTEMBER 17.—**Brentford.**—COOKING APPARATUS.—Guardians of the Brentford Union invite tenders for supplying one cast-iron steam-jacketed vegetable boiling-pan; one carving-table and hot closet; alterations to existing hot closet; vegetable and potato steamers; and one gas roaster. Specification may be seen, and form of tender obtained, from Mr. William Stephens, Clerk to the Guardians, Union Offices, Isleworth, W.

SEPTEMBER 18.—**Dublin.**—IRON FENCING.—South Dublin R.D.C. invite tenders for iron fencing. Particulars are set out on the schedule attached to the tender forms, which may be obtained from Mr T. J. Byrne, Clerk of Council, 1, James's-street, Dublin.

SEPTEMBER 18.—**Glasgow.**—STREET NAME AND NUMBER PLATES.—Glasgow Corporation invite offers for supplying and fitting up enamel street name and number plates in the Western and the St. Rollox Police Districts. Specifications and forms of tender may be had from Mr. Thomas Nisbet, Master of Works, City Chambers, Glasgow.

✱ SEPTEMBER 21.—**Tipperary.**—ROAD-MAKING MACHINERY.—The Tipperary C.C. invite tenders for two steam road rollers, two sleeping-vans, and four water-carts. For further particulars refer to an advertisement in this issue.

✱ OCTOBER 3.—**Hull.**—FITTINGS AND FURNITURE.—The Hull Corporation invite tenders for supply of fittings and furniture at the new Law Courts, Town Hall Extension, Hull. For further particulars see advertisement in this issue.

PAINTING, etc.

SEPTEMBER 16.—**Thornton Heath.**—PAINTING.—Croydon Guardians invite tenders for internal painting, etc., of the cottage homes, Mayday-road, Thornton Heath, Surrey. The specification and conditions of contract may be seen, and bills of quantities and form of tender obtained, at the office of Mr. Henry Berney, architect, 104, George-street, Croydon, Surveyor to the Guardians, upon depositing the sum of 2*l.* 2s.

SEPTEMBER 17.—**Brentford.**—CLEANING AND PAINTING.—The Guardians of the Brentford Union invite tenders for cleaning and painting the exterior wood and iron work at the infirmary and the schools at Isleworth. Specifications can be seen upon application at office of Mr. William Stephens, Clerk to the Guardians, Union Offices, Isleworth, W., where any further information can be obtained.

ROADS, SANITARY, AND WATER WORKS.

SEPTEMBER 9.—**Warrington.**—FORMING AND PAVING.—Paving and Sewerage Committee of the Council of the County Borough of Warrington invite tenders for the forming and paving of a passage. Drawings, specifications, etc., may be seen, and forms of tender, bills of quantities, and all further information obtained, at the office of the Borough Surveyor, Town Hall, Warrington.

SEPTEMBER 10.—**Bingley.**—SEWAGE WORKS.—Bingley D.C. invite tenders for laying out 8½ acres of intermittent filtration works at Dowley Gap, Bingley. Plans and specification may be seen, and quantities obtained, at the office of the Engineer, Mr. R. Armistead, 8, Charles-street, Bradford.

SEPTEMBER 12.—**Crich.**—DRAINAGE.—Belper R.D.C. invite tenders for the construction of about 450 yds. of 9-in pipe sewers with the necessary manholes, lampholes, and ventilators, in the hamlet of Fritchley, in the parish of Crich. Plans, sections, specification, and conditions may be seen, and bill of quantities obtained, upon application (by appointment only) to Mr. Robt. C. Cordon, Engineer and Surveyor to the R.D.C., Duffield, near Derby, on deposit of 1*l.* 1s.

SEPTEMBER 12.—**Havant.**—DRAINAGE.—Havant Joint Hospital District Board invite tenders from builders in the district of the Havant Union for altering the existing drains and laying down new ones and other works in the grounds of the Hospital in Park-road, Havant. Plans and specification can be inspected at the office of Mr. A. E. Stallard, F.S.I., Park-road, Havant, between 10 a.m. and 4 p.m.

SEPTEMBER 12.—**Stanion.**—RESERVOIR, ETC.—Kettering R.D.C. invite tenders for the sinking of a well, construction of a reservoir, supply and laying of cast-iron mains, etc., at Stanion. Plans may be seen, and copies of the specification and bill of quantities obtained, on aplication to Mr. Beeby Thompson, 67, Victoria-road, Northampton, accompanied by a deposit of 1*l.* 1s.

SEPTEMBER 16.—**Buckfast.**—SEWER EXTENSION.—Buckfastleigh U.D.C. invite tenders for extension of the main sewer at Buckfast. Plans and specifications can be seen, and bill of quantities obtained, on deposit of 2*l.* 2s. at the office of the Surveyor, Mr. Andrew Warren, Fore-street, Buckfastleigh.

SEPTEMBER 16.—**Peterhead.**—WATERWORKS IMPROVEMENTS.—Peterhead T.C. invite tenders for the works (under one contract) in connexion with extensions and improvements of the Burgh Waterworks. The drawings and general conditions of contract may be seen, and copies of the specification and schedule of quantities may be obtained, at the office of Messrs. Walker & Duncan, civil engineers, 3, Golden-square, Aberdeen, on payment of 2*l.* 2s.

SEPTEMBER 16.—**Rainham.**—PRIVATE STREET WORKS, ETC.—Romford R.D.C. invite tenders for the making-up, etc., of Melville-road and Cowper-road, in the parish of Rainham. Also for the construction of surface-water drains and outfall in connexion with the same works. Plans and specifications can be seen, and forms of tender obtained, at the office of Mr. E. G. Boden, the Council's Surveyor, Victoria-chambers, Victoria-road, Romford, between the hours of 10 a.m. and 4 p.m., Saturdays, 10 a.m. to 1 p.m.

SEPTEMBER 17.—**Croydon.**—STREET WORKS.—Croydon B.C. invite tenders for the repair of Courtney-place. Plans and specification of the required works may be seen, and forms of tender obtained, on application at the Borough Road Surveyor's office, Town Hall, Croydon.

SEPTEMBER 17.—**Gosport.**—PRIVATE STREET WORKS.—Gosport and Alverstoke U.D.C. invite tenders for the making-up and completion of certain streets. Plans may be seen, and specifications, forms of tender, and particulars obtained (upon deposit of a cheque for 1*l.* 1s.), at the office of the Surveyor to the Council, Mr. H. Frost, Town Hall, Gosport.

SEPTEMBER 17.—**Spennymoor.**—ASPHALTING FOOTPATH.—Spennymoor U.D.C. invite tenders for the asphalting of the footpath leading from the railway-station to Merington-lane, Spennymoor. Plans, specifications, etc., may be seen, and forms of tender obtained, from Mr. C. R. Spencer, Surveyor to the Council, Spennymoor.

SEPTEMBER 18.—**Hornsey.**—ROAD WORKS.—Hornsey T.C. invite tenders for sewering, levelling, paving, metalling, kerbing, channelling, and making good the passage or roadway (sections 1 and 2) at the rear of Nos. 43 to 79, High-road, Wood Green. Forms of tender, etc., and particulars, can be obtained from Mr. E. J. Lovegrove, Borough Engineer and Surveyor, Municipal Offices, Highgate, on any morning between 10 and 12 o'clock.

SEPTEMBER 18.—**Middleton.**—ROAD WORKS.—Middleton Corporation invite tenders for the making-up of a portion of Baytree-lane. Plans may be seen, and specifications, quantities, and form of tender obtainable, on payment of 10s 6d., on application to Mr. W. Welburn, Borough Surveyor, at his office, Town Hall, Middleton, between the hours of 9.30 and 10.30 a.m.

SEPTEMBER 21.—**Leyland.**—SEWAGE OUTFALL WORKS, ETC.—Leyland U.D.C. invite tenders for the construction of precipitation tanks, chambers, conduits, roadways, subsoil drainage, and other works at the sewage farm. Drawings and specifications may be seen, and the bill of quantities obtained (on payment of 2*l.* 2s), at the office of Mr. Wilkinson, Surveyor to the Council, Public Hall, Leyland; or at the office of the Engineer, Mr. William Wrennall, 9, Harrington-street, Liverpool.

NO DATE.—**Brancepeth.**—ROAD WORKS.—Main road diversion at Brancepeth, including excavation, masonry, retaining walls, etc. Names to Mr. Parker, A.M.Inst.C.E., Post Office-chambers, Newcastle-on-Tyne. Quantities supplied.

STONE, MATERIALS, AND STORES.

SEPTEMBER 11.—**Eastleigh and Bishopstoke.**—STORES.—Eastleigh and Bishopstoke U.D.C. invite tenders for the supply and delivery of various stores, including oils, coal tar, and Portland cement. Particulars, estimated quantities, and forms of tenders can be obtained from Mr. W. Wallace Gandy, Surveyor to the Council, offices of the Council, Leigh-road, Eastleigh.

SEPTEMBER 13.—**Guildford.**—STORES.—Guildford R.D.C. invite tenders for the supply of roadmen's tools, also for the supply of sundries for steam rollers. Forms of tender can be obtained from the Council's Surveyor, at his office in Commercial-road, Guildford.

SEPTEMBER 16.—**Faversham.**—GRANITE.—Faversham Corporation invites tenders for the supply of 700 tons (more or less) of Guernsey granite, Rhenish basalt, or Quenast, broken to a 2-in. gauge. Mr. Allan Tassell, Town Clerk, 20, West-street, Faversham.

SEPTEMBER 18.—**Rochdale.**—GAS OIL.—Gas and Electricity Committee of the Rochdale Corporation invite tenders for the supply of about 1,000 tons of oil suitable for the manufacture of carburetted water gas during a period of twelve months from October 1, 1907. Any further information may be obtained on application to Mr. T. Banbury Ball, the manager at the Gasworks.

SEPTEMBER 21.—**Neath Abbey.**—STORES.—Directors of the Main Colliery Company Ltd., invite tenders for the supply of stores. Forms of tenders and all particulars can be obtained on application to the Neath Abbey Office of the Main Colliery Company, Ltd.

NO DATE.—**Manchester.**—GRAVEL.—The Paving, Sewering, and Highways Committee of the Manchester Corporation invite offers for supply of gravel, suitable for paving purposes, delivered at their various yards throughout the city. Offers to be addressed to the Chairman, Paving, etc., Committee, Town Hall, Manchester.

Public Appointment.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
*DRAUGHTSMAN (BOARD OF AGRICULTURE)	Civil Service Commissioners	Not stated	Sept. 26

Auction Sales.

Nature and Place of Sale.	By whom Offered.	Date of Sale.
*BUILDERS' STOCK-IN-TRADE, PLANT, ETC., BRIGHTON—On the Premises.....	Samuel Ridley & Hollis	Sept. 10
*DEALS, BATTENS, ETC.—Great Hall, Winchester House, Old Broad-street, E.C.	Churchill & Sims	Sept. 11
*FREEHOLD BUILDING PLOTS, HARROW-ON-THE-HILL—Roxborough Hotel, Harrow	Protheroe & Norris	Sept. 16
*JOINERY MANUFACTURER'S STOCK-IN-TRADE. TOOTING—On the Premises	H. W. Smith	Sept. 17
*BRICKMAKING PLANT, SHOEBURYNESS—On the Premises.....	Fuller, Horsey, Sons, & Cassell	do.
*BUILDERS' PLANT, FURNITURE, ETC., KENSINGTON—On the Premises	John W. Morley & Co.	Sept. 18
*SLATE SLABS AND ROOFING SLATES—Oak Wharf, Millwall	Fuller, Horsey, Sons, & Cassell	Sept. 19
*STOCK OF PAPERHANGINGS—3, Redcross-street, E.C.	Fryer, Cooper, & Co.	do.
*PLANT AND MACHINERY, SHEPHERD'S BUSH—On the Premises	Hibbard & Whittingham	Sept. 25
*BUILDING SITE, OLD CHANGE, E.C.—At the Mart.....	Norton, Trist, & Gilbert	Oct. 9

PATENTS.—*Continued from page* 279.

12,725 of 1907.—A. LIPS: *Devices for Opening and Closing Sky-lights and the like, and locking the same.*

This relates to a locking device for sky-lights and the like having a cord lever operated by a single cord during the opening and closing operations, said cord lever being revoluble on the casement and acting on the locking arrangement, and on a push-off device for pushing the casement out of the frame, and is characterised by the locking hook being united with the push-off lever to form a single locking portion likewise revoluble on the casement, which portion is so rotated through the instrumentality of a coupling by the cord-lever during the opening of the window, that first of all the locking hook leaves its eye on the frame of the window and then the push-off lever comes into action, while the locking portion, on the cord-lever being pulled to the fullest extent, is released by the then resulting automatic uncoupling of the coupling so that under the action of its spring it snaps back into the locking position, and on the window being closed, can snap into the eye independently of the cord-lever.

14,260 of 1907.—F. M. CLAPP: *Production of Surfaces in Imitation of Graining.*

This relates to a process of producing surfaces in imitation of graining, and is characterised by applying to the surface a graining compound carried by a volatile medium, allowing said medium to evaporate, and applying over the graining compound a varnish to bind the graining compound to the surface being grained.

15,782 of 1907.—C. E. LEIGHTON: *Lock-protecting Devices.*

This relates to a protecting device for knobbed back permutation locks, consisting of a guard-member having a recess adapted to receive said knob, and a lip adapted to engage the underside thereof, and having a tumbler engaging member adapted for co-operation with the lock tumblers.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

August 20.—By R. WOOD (at Hay).

Hay, Brecon.—The Oakfield Estate, 412a. 2r. 14p., f.....	£12,552

August 22.—By BENJAMIN SIMONS & CO. (at Skegness).

Skegness, Lincoln.—Scarborough-av., Leeson Lodge, f.....	1,360
Winthorpe, Lincoln.—Roman Bank-rd., Victoria House, f.....	410

August 27.—By WYATT & SON (at Selsey).

Selsey, Sussex.—West-la., 1, 2, and 3, The Verandah, f.	490

August 28.—By FRED VARLEY & SON.

Highbury.—58 and 60, Elwood-st., u.t 69 yrs., g r. 12*l.* 12s., y.r. 64*l.*	500
1, Mountgrove-rd., u.t. 63 yrs., g r. 6*l.* 6s., e.r. 40*l.*	335
Harringay.—86, Rosebery-gdns., u.t. 82 yrs., g.r. 6*l.* 6s., e.r. 32*l.*.....	200

Contractions used in this list.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; gr. for grove; b.h. for beerhouse; p.h. for public-house; o. for office; s. for shops; ct. for court.

MEETINGS.

SATURDAY, SEPTEMBER 7.

Junior Institution of Engineers.—Visit to the Works of the Metropolitan Water Board, at Hampton-on-Thames. 3 p.m.

SATURDAY, SEPTEMBER 14.

Incorporated Association of Municipal and County Engineers.—Midland District Meeting at Bilston.

PRICES CURRENT OF MATERIALS.

**** **Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.**

BRICKS, &c.

	£ s. d.	
Hard Stocks.....	1 7 0	per 1000 alongside, in river.
Rough Stocks and Grizzles	1 6 0	,, ,, ,,
Picked Stocks for Facings	2 10 0	,, delivered.
Flettons.....	1 6 0	,, at railway depôt.
Red Wire Cuts ...	1 14 0	,, ,, ,,
Best Fareham Red	3 12 0	,, ,, ,,
Best Red Pressed Ruabon Facing..	5 0 0	,, ,, ,,
Best Blue Pressed Staffordshire ...	3 15 0	,, ,, ,,
Do. Bullnose	4 0 0	,, ,, ,,
Best Stourbridge Fire Bricks	3 14 0	,, ,, ,,

GLAZED BRICKS.

Best White and Ivory Glazed Stretchers.....	12 0 0	,, ,, ,,
Headers.....	11 0 0	,, ,, ,,
Quoins, Bullnose, and Flats	16 0 0	,, ,, ,,
Double Stretchers	19 0 0	,, ,, ,,
Double Headers ...	16 0 0	,, ,, ,,
One Side and two Ends	19 0 0	,, ,, ,,
Two Sides and one End.....	20 0 0	,, ,, ,,
Splays, Chamferred, Squints..	20 0 0	,, ,, ,,
Best Dipped Salt Glazed Stretchers, and Header.	12 0 0	,, ,, ,,
Quoins, Bullnose, and Flats	14 0 0	,, ,, ,,
Double Stretchers	15 0 0	,, ,, ,,
Double Headers ...	14 0 0	,, ,, ,,
One Side and two Ends	15 0 0	,, ,, ,,
Two Sides and one End.....	15 0 0	,, ,, ,,
Splays, Chamferred, Squints..	14 0 0	,, ,, ,,
Second Quality White and Dipped Salt Glazed	2 0 0	,, less than best.

	s. d.	
Thames and Pit Sand	7 0	per yard, delivered
Thames Ballast	5 6	,, ,,
Best Portland Cement	28 0	per ton, ,,
Best Ground Blue Lias Lime	19 0	,, ,,

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime	11s. 6d. per yard, delivered.
Stourbridge Fireclay in sacks	27s. 0d. per ton at rly. dpt

STONE.

	s. d.	
BATH STONE—delivered on road waggons, Paddington Depôt	1 6½	per ft. cube
Do. do. delivered on road waggons, Nine Elms Depôt	1 8½	,, ,,
PORTLAND STONE (20 ft. average)— Brown Whitbed, delivered on road waggons, Paddington Depôt, Nine Elms Depôt, or Pimlico Wharf...	2 1	,, ,,
White Basebed, delivered on road waggons, Paddington Depôt, Nine Elms Depôt, or Pimlico Wharf...	2 2½	,, ,,

	s. d.	
Ancaster in blocks.....	1 10	per ft. cube, deld. rly. depôt.
Beer ,, ...	1 6	,, ,,
Greenshill ,, ...	1 10	,, ,,
Darley Dale in blocks ...	2 4	,, ,,
Red Corsehill ,, ...	2 2	,, ,,
Closeburn Red Freestone	2 0	,, ,,
Red Mansfield ,,	2 4	,, ,,

YORK STONE—*Robin Hood Quality.*

Scappled random blocks.	2 10	,, ,,
6 in. sawn two sides landings to sizes (under 40 ft. super.).....	2 3	per ft. super., ,,
6 in. rubbed two sides ditto, ditto	2 6	,, ,,
3 in. sawn two sides slabs (random sizes).....	0 11½	,, ,,

STONE (*continued*).

	s. d.	
2 in. to 2½ in. sawn one side slabs (random sizes)	0 7½	per ft. supr. deld. rly. dep.
½ in. to 2 in. ditto, ditto	0 6	,, ,,

HARD YORK—

Scappled random blocks.	3 0	per ft. cube, ,,
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2 8	per ft. super. ,,
6 in. rubbed two sides ditto	3 0	,, ,,
3 in. sawn two sides slabs (random sizes)	1 2	,, ,,
2 in. self-faced random flags	0 5	,, ,,

SLATES.

In. In.	£ s. d.	
20×10 best blue Bangor	13 2 6	per 1000 of 1200 at r. d.
20×12 ,, ,,	13 17 6	,, ,,
20×10 first quality ,,	13 0 0	,, ,,
20×12 ,, ,,	13 15 0	,, ,,
16×8 ,, ,,	7 5 0	,, ,,
20×10 best blue Portmadoc	12 12 6	,, ,,
16×8 ,, ,,	6 12 6	,, ,,
20×10 best Eureka unfading green...	15 17 6	,, ,,
20×12 ,, ,, ...	18 7 6	,, ,,
18×10 ,, ,, ...	13 5 0	,, ,,
16×8 ,, ,, ...	10 5 0	,, ,,
20×10 permanent green	11 12 6	,, ,,
18×10 ,, ,,	9 12 6	,, ,,
16×8 ,, ,,	6 12 6	,, ,,

TILES.

	s. d.	
Best plain red roofing tiles...	42 0	per 1000 at rly. depôt.
Hip and Valley tiles ...	3 7	per doz. ,,
Best Broseley tiles	50 0	per 1000 ,,
Do. Ornamental tiles	52 6	,, ,,
Hip and Valley tiles ...	4 0	per doz. ,,
Best Ruabon red, brown, or brindled do. (Edwards) ...	57 6	,, ,,
Do. Ornamental do.	60 0	,, ,,
Hip tiles	4 0	per doz. ,,
Valley tiles	3 0	,, ,,
Best Red or Mottled Staffordshire do. (Peakes)	51 9	per 1000 ,,
Do. Ornamental do.	54 6	,, ,,
Hip tiles	4 1	per doz. ,,
Valley tiles	3 8	,, ,,
Best "Rosemary" brand plain tiles.....	48 0	per 1000 ,,
Best Ornamental tiles	50 0	,, ,,
Hip tiles	4 0	per doz. ,,
Valley tiles.....	3 8	,, ,,
Best "Hartshill" brand plain tiles, sand-faced	50 0	per 1000 ,,
Do. pressed	47 6	,, ,,
Do. Ornamental do.	50 0	,, ,,
Hip tiles	4 0	per doz. ,,
Valley tiles	3 6	,, ,,

WOOD.

BUILDING WOOD.	At per standard. £ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	13 10 0	... 15 0 0
Deals: best 3 by 9	13 0 0	... 14 0 0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	11 0 0	... 12 0 0
Battens: best 2½ by 6 and 3 by 6...	0 10 0	less than 7 in. and 8 in.
Deals: seconds	1 0 0	less than best.
Battens: seconds.....	0 10 0	,, ,,
3 in. by 4 in. and 2 in. by 6 in....	9 0 0	... 10 0 0
2 in. by 4½ in. and 2 in. by 5 in...	8 10 0	... 9 10 0
Foreign Sawn Boards— 1 in. and 1¼ in. by 7 in.	0 10 0	more than battens.
¾ in.	1 0 0	,,

	At per load of 50 ft.	
Fir timber: best middling Danzig or Memel (average specification)	4 10 0	... 5 0 0
Seconds	4 0 0	... 4 10 0
Small timber (8 in. to 10 in.) ...	3 12 6	... 3 15 0
Small timber (6 in. to 8 in.)	3 0 0	... 3 10 0
Swedish balks	2 10 0	... 3 0 0
Pitch-pine timber (30 ft. average)	4 0 0	... 4 15 0

JOINERS' WOOD.	At per standard.	
White Sea: first yellow deals, 3 in. by 11 in.	24 0 0	... 25 0 0
3 in. by 9 in.	22 0 0	... 23 0 0
Battens, 2½ in. and 3 in. by 7 in.	16 10 0	... 18 0 0

WOOD (*continued*).

JOINERS' WOOD (*continued*)—	At per standard. £ s. d.	£ s. d.
Second yellow deals, 3 in. by 1 in.	18 10 0	... 20 0 0
,, ,, 3 in. by 9 in.	17 10 0	... 19 0 0
Battens, 2½ in. and 3 in. by 7 in.	13 10 0	... 14 10 0
Third yellow deals, 3 in. by 11 in. and 9 in.	13 10 0	... 15 0 0
Battens, 2½ in. and 3 in. by 7 in.	11 0 0	... 12 0 0
Petersburg first yellow deals, ⅝ in. by 11 in.	21 0 0	... 22 10 0
Do. 3 in. by 9 in.	18 0 0	... 19 10 0
Battens	13 10 0	... 15 0 0
Second yellow deals, 3in. by 11in.	16 0 0	... 17 0 0
Do. 3 in. by 9 in.	14 10 0	... 16 0 0
Battens	11 0 0	... 12 10 0
Third yellow deals, 3 in. by 11 in.	13 0 0	... 14 0 0
Do. 3 in. by 9 in.	12 10 0	... 14 0 0
Battens	10 0 0	... 11 0 0
White Sea and Petersburg—		
First white deals, 3 in. by 11 in.	14 10 0	... 15 10 0
,, ,, 3 in. by 9 in.	13 10 0	... 14 10 0
Battens	11 0 0	... 12 0 0
Second white deals, 3 in. by 11 in.	13 10 0	... 14 10 0
,, ,, 3 in. by 9 in.	12 10 0	... 13 10 0
,, ,, battens	10 0 0	... 11 0 0
Pitch pine: deals	18 0 0	... 21 0 0
Under 2 in. thick extra	0 10 0	... 1 0 0
Yellow Pine—First, regular sizes	44 0 0	upwards.
Oddments	32 0 0	,,
Seconds, regular sizes	33 0 0	,,
Yellow Pine oddments	28 0 0	,,
Kauri Pine—Planks, per ft. cube	0 3 6	... 0 5 0
Danzig and Stettin Oak Logs—		
Large, per ft. cube	0 3 0	... 0 3 6
Small ,, ,,	0 2 6	... 0 2 9
Wainscot Oak Logs, per ft. cube	0 5 6	... 0 6 0
Dry Wainscot Oak, per ft. sup. as inch	0 0 8½	... 0 0 ½
¾ in. do. do	0 0 7	... —
Dry Mahogany—Honduras, Tabasco, per ft. super. as inch	0 0 9	... 0 1 0
Selected, Figury, per ft. super. as inch	0 1 6	... 6
Dry Walnut, American, per ft. super. as inch	0 0 10	... 0 1 0
Teak, per load	17 0 0	... 22 0 0
American Whitewood Planks, per ft. cube	0 4 0	... 0 5 0
Prepared Flooring, etc.—	Per square.	
1 in. by 7 in. yellow, planed and shot	0 13 6	... 0 17 6
1 in. by 7 in. yellow, planed and matched	0 14 0	... 0 18 0
1¼ in. by 7 in. yellow, planed and matched	0 16 0	... 1 0 0
1 in. by 7 in. white, planed and shot	0 12 0	... 0 14 6
1 in. by 7 in. white, planed and matched	0 12 6	... 0 15 0
1¼ in. by 7 in. white, planed and matched	0 15 0	... 0 16 6
¾ in. by 7 in. yellow, matched and beaded or V-jointed brds.	0 11 0	... 0 13 6
1 in. by 7 in. ,, ,,	0 14 0	... 0 18 0
¾ in. by 7 in. white ,, ,,	0 10 0	... 0 11 6
1 in. by 7 in. ,, ,,	0 12 9	... 0 15 0

6 in. at 6d. to 9d. per square less than 7 in.

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	7 7 6	... 7 15 0
Compound Girders, ordinary sections	9 10 0	... 10 10 0
Steel Compound Stanchions	12 5 0	... 13 5 0
Angles, Tees, and Channels, ordinary sections	9 5 0	... 10 5 0
Flitch Plates	9 5 0	... 10 5 0
Cast Iron Columns and Stanchions including ordinary patterns	8 0 0	... 9 0 0

METALS.

IRON—	Per ton, in London. £ s. d.	£ s. d.
Common Bars	8 10 0	... 9 0 0
Staffordshire Crown Bars, good merchant quality	9 5 0	... 9 15 0
Staffordshire "Marked Bars"	11 0 0	... —
Mild Steel Bars	9 10 0	... 9 15 0
Hoop Iron, basis price	9 15 0	... 10 0 0
,, ,, Galvanised	17 10 0	... —
("And upwards, according to size and gauge.)		
Sheet Iron Black—		
Ordinary sizes to 20 g.	10 0 0	... —
,, ,, 24 g.	11 0 0	... —
,, ,, 26 g.	12 10 0	... —
Sheet Iron, Galvanised, flat, ordinary quality—		
Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	16 0 0	... —
Ordinary sizes to 22 g. and 24 g.	16 10 0	... —
,, ,, 26 g.	17 0 0	... —
Sheet Iron, Galvanised, flat, best quality—		
Ordinary sizes to 20 g.	19 0 0	... —
,, ,, 22 g. and 24 g.	19 10 0	... —
,, ,, 26 g.	21 0 0	... —
Galvanised Corrugated Sheets—		
Ordinary sizes 6 ft. to 8 ft. 20 g.	16 0 0	... —
,, ,, 22 g. and 24 g.	16 5 0	... —
,, ,, 26 g.	17 10 0	... —
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	13 0 0	... —
Best Soft Steel Sheets, 22 g. & 24 g.	14 0 0	... —
,, ,, 26 g.	16 0 0	... —
Cut Nails, 3 in. to 6 in.	10 15 0	... 11 5 0
(Under 3 in., usual trade extras.)		

LEAD, &c.

	Per ton, in London. £ s. d.	£ s. d.
LEAD—Sheet, English, 3lb. and up.	23 0 0	... —
Pipe in coils	23 10 0	... —
Soil pipe	25 10 0	... —
Compo pipe	26 10 0	... —
ZINC—Sheet—		
Vieille Montagne ...ton	32 10 0	... —
Silesian	32 5 0	... —

LEAD, &c. (*continued*).

COPPER—	£ s. d.	£ s. d.
Strong Sheet ...per lb.	0 1 4	... —
Thin ,, ... ,,	0 1 5	... —
Copper nails ... ,,	0 1 3	... —
BRASS—		
Strong Sheet ... ,,	0 1 2	... —
Thin ,, ... ,,	0 1 3	... —
TIN—English Ingots ... ,,	0 1 11	... —
SOLDER—Plumbers' ... ,,	0 0 9	... —
Tinmen's ... ,,	0 0 11	... —
Blowpipe ... ,,	0 1 1	... —

ENGLISH SHEET GLASS IN CRATES OF STOCK SIZES.

15 oz. thirds	2½d. per ft. delivered.
,, fourths	1⅞d. ,, ,,
21 oz. thirds	3⅛d. ,, ,,
,, fourths	2⅜d. ,, ,,
26 oz. thirds	4¼d. ,, ,,
,, fourths	3¼d. ,, ,,
32 oz. thirds	5d. ,, ,,
,, fourths	4⅛d. ,, ,,
Fluted Sheet, 15 oz.	3⅛d. ,, ,,
,, 21 oz.	4⅛d. ,, ,,

ENGLISH ROLLED PLATE IN CRATES OF STOCK SIZES.

⅛ Hartley's	2½d. per ft. delivered.
¼ ,,	2½d. ,, ,,
½ ,,	3d. ,, ,,
Figured and Oxford Rolled "Oceanic" Glass, white ...	4d. ,, ,,
Do. ,, tinted ...	5½d. ,, ,,

OILS, &c.

		£ s. d
Raw Linseed Oil in pipes	per gallon	0 2 1
,, ,, ,, in barrels	,,	0 2 2
,, ,, ,, in drums	,,	0 2 4
Boiled ,, ,, in pipes	,,	0 2 3
,, ,, ,, in barrels	,,	0 2 4
,, ,, ,, in drums	,,	0 2 5
Turpentine in barrels	,,	0 3 5
,, in drums	,,	0 3 7
Genuine Ground English White Lead	per ton	26 10
Red Lead, Dry	,,	24 10 0
Best Linseed Oil Putty	per cwt.	0 7 0
Stockholm Tar	per barrel	1 12 0

VARNISHES, &c.

	Per gallon. £ s. d.
Fine Pale Oak Varnish	0 8 0
Pale Copal Oak	0 10 6
Superfine Pale Elastic Oak	0 12 6
Fine Extra Hard Church Oak	0 10 0
Superfine Hard-drying Oak, for seats of Churches	0 14 0
Fine Elastic Carriage	0 12 6
Superfine Pale Elastic Carriage	0 16 0
Fine Pale Maple	0 16 0
Finest Pale Durable Copal	0 18 0
Extra Pale French Oil	1 1 0
Eggshell Flatting Varnish	0 18 0
White Copal Enamel	1 4 0
Extra Pale Paper	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
French and Brush Polish	0 10 0

PUBLISHER'S NOTICES.

Nat. Tel., 6112 Gerrard. Telegrams, "The Builder, London."

THE INDEX (with TITLE-PAGE) for VOLUME XCII. (January to June, 1907) was given as a supplement with the issue for July 13.

CLOTH CASES for Binding the Numbers are now ready, price 2s. 6d. each; also

READING CASES (Cloth), with Strings price 9d. each,

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Each additional line ... 1s. 0d.

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*** Stamps *must not* be sent, but all sums should be remitted by Postal Orders, payable to J. MORGAN, and addressed to the Publisher of "THE BUILDER," 4, Catherine Street, W.C.

Advertisements for the current week's issue are received up to ONE p.m. on THURSDAY, but "Classification" is impossible in the case of any which may reach the Office after TWELVE NOON on that day. Those intended for the Outside Wrapper should be in by TWELVE NOON on WEDNESDAY.

ALTERATIONS IN STANDING ADVERTISEMENTS or ORDERS TO DISCONTINUE same must reach the Office before TEN o'clock on WEDNESDAY MORNING.

The Publisher cannot be responsible for DRAWINGS, TESTIMONIALS, etc., left at the Office in reply to advertisements, and strongly recommends that of the latter COPIES ONLY should be sent.

ADVERTISERS in "THE BUILDER" may have *Replies addressed to the Office, 4, Catherine Street, Covent Garden, W.C., free of charge.* Letters will be forwarded if addressed envelopes are sent, together with sufficient stamps to cover the postage. Unused stamps are returned to advertisers the week after publication.

N.B.—The Reply Boxes are not intended for trade lists, circulars, and the like; should these be received, they cannot (if noticed) be forwarded.

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READING CASES { NINEPENCE EACH. By post (carefully packed) 1s.

TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications; and the Editor cannot be responsible for drawings, photographs, manuscripts, or other documents, or for models or samples, sent to or left at this office, unless he has specially asked for them.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

All communications must be authenticated by the name and address of the sender whether for publication or not. No notice can be taken of anonymous communications.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance. The Editor cannot undertake to read and consider articles offered for acceptance unless they are type-written.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays.* [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is stated, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted.* † Denotes *provisionally accepted.*

ALDERSHOT.—For constructing an underground convenience in the High-street, for the Urban District Council. Mr. F. C. Uren, Surveyor, Municipal-buildings, Aldershot:—

W. Norris	£429	G. Kemp, Aldershot*	£383
W. Edgoose	428		

[Surveyor's estimate £392.]

BEDDINGTON (Surrey).—Restoration of the Church of St. Mary the Virgin. Mr. H. P. Burke-Downing, F.R.I.B.A., architect, 12, Little College-street, Westminster Abbey, S.W.:—

J. W. Falkner & Sons	£627	Duncan, Stewart, & Sons	£601
E. J. Burnand	616	W. Dawson & Son*	576

BOURNEMOUTH.—Proposed new church of St. Augustin, Bournemouth, for first portion of work, including chancel, chapel, vestries, transepts, and three bays of nave. Mr. Geo. H. Fellowes Prynne, F.R.I.B.A., architect, 6, Queen Anne's-gate, Westminster. Quantities by Mr. R. Henry Hale, F.S.I., 6, Queen Anne's-gate, Westminster:—

J. & C. Bowyer	£8,962 0 0
C. Trask & Sons	8,565 16 7
Miller & Sons	8,390 16 6
Archer & Sons	8,383 0 0
Luscombe & Sons	8,380 0 0
J. Long & Co.	8,314 0 0
W. Hoare & Sons	8,299 2 7
Jarvis & Sons	8,160 0 0
George & Harding	8,115 0 0
J. J. Wise & Son	8,064 8 5
McWilliam & Sons	7,991 0 0
Jones & Seward	7,897 0 0
Goddard & Sons	7,869 4 3
W. E. Jones & Sons	7,793 0 0
Jenkins & Sons	7,684 0 0
R. Wilkins & Sons	7,584 0 0
Messrs. Bowman & Sons, Stamford*	7,337 10 0

CANNINGTON.—For water supply works for the Bridgwater Town Council. Mr. Francis Parr. Quantities by the Engineer:—

Pinder & Son	£740 15 11½	C. Bryer	£450
W. P. Merkle	704 1 11	Wright & Son, Glastonbury*	390
Pollard & Co.	500 0 0		

CHERTSEY.—For the erection of New Council Schools at Chertsey, for the Surrey Education Committee Messrs. Jarvis & Richards, Architects:—

T. Knight & Sons	£17,320 9 11	W. Smith & Sons	£13,598 0 0
G. Gray	14,957 0 0	Wakeham Bros.	13,534 0 0
Tribe & Robinson	14,290 0 0	T. J. Hawkins & Co.	13,454 0 0
G. Kemp	13,749 0 0	J. Burges & Sons*	13,398 0 0
G. Cummins & Sons, Ltd.	13,743 0 0	Martin, Wells & Co., Ltd.‡	12,832 0 0
Goddard & Sons	13,712 0 0		

‡ Withdrawn.

CHESTERFIELD.—For alterations to premises in Theatre-yard, for the Corporation. Mr. S. B. D. Shewbrooks, architect, Market-place, Chesterfield. Quantities by architect:—

J. Collis & Sons	£397 11	D. Brown, Hasland, near Chesterfield*	£363
J. Wright	378 0		
G. F. Kirk	369 0		

CLENCHWARTON.—For alterations, painting, etc., at High House, for Mr. Hugh Kerkham. Messrs. Walker & Walker, architects, Wisbech and Terrington:—

Dye & Allen	£151	Barnes & Co., King's Lynn	£118
S. Boon	147		
Tash & Langley	120		

DURHAM.—For relief sewers and manholes, between Atherton-street and the County Hospital, and branch sewer near Banks mill, for the Corporation. Mr. J. T. Pegge, city surveyor, Durham :—

B. Firth & Co.	£373 10 0
G. T. Manners	295 0 0
J. Carrick, Durham*	274 14 4
Beevers & Clark (part work)	194 5 2

[City surveyor's estimate, £274 2s. 4d.]

GOLCAR.—For erecting new club, Levmoor, for the Thorp Green Working Men's Club and Institute. Mr. Arthur Shaw, architect, Golcar :—

Masons : G. Milnes & Sons, Leymoor, Golcar	£220 0 0
Joiners : J. Crowther & Son, Wellhouse, Golcar	86 17 0
Plumbing and Slating : T. Allison, Ltd., Market-street, Milnsbridge	58 9 6
Plasterer and Painter : F. Cheetham, Town-end, Golcar	26 16 6
Heating Engineer : F. Milan, Hydro Works, Lockwood, Huddersfield	30 0 0
Concreter : J. E. Dyson Lindley, Huddersfield	24 4 9

HERTFORD.—For painting the exterior of the Workhouse, Workhouse Infirmary, Infectious Wards, and Tramp Wards, for the Guardians :—

Ekins & Co., Ltd., Hertford £89 18 9

KENILWORTH.—For drainage and sewage works at the Kennels, Rouncil-lane, for the North Warwickshire Hunt Kennels Trustees. Mr. Sholto Douglas, C.E., Engineer to the Trustees, Priory-road, Kenilworth :—

Smith & Sons £415	E. Smith & Son, Kenilworth* £351

[Engineer's estimate, £339.]

KNARESBROUGH.—For 4,620 yds. of main sewer at Pannal, for the Rural District Council. Mr. W. Lupton, Surveyor to the Council :—

J. H. Wood, St. Columba-street, Leeds.. £1,965

LEICESTER.—For alterations and additions to the workhouse, for the Guardians. Mr. A. H. Hind, A.R.I.B.A., Grey Friars, Leicester :—

Hardington & Elliott	£1,693 0 0	Hutchinson & Son.....	£1,570 0 0
Haskard, Rudkin, & Beck	1,635 0 0	Chapman	1,560 0 0
Phipps	1,614 17 0	Stanger	1,539 0 0
Bentley & Co.	1,610 0 0	Simons	1,534 0 0
T. Herbert ..	1,607 0 0	C. Wright....	1,530 0 0
J. Pipes.....	1,595 0 0	Rudkin & Son	1,524 0 0
H. Herbert ..	1,590 0 0	Bradford	1,521 4 6
E. Fox	1,578 0 0	A. & W. Chambers, Leicester*	1,497 10 0

LEVEN (Scotland).—For erecting new premises for the Reform Co-operative Society. Mr. W. Dow, architect, Kirkcaldy :—

Masons : G. Smith & Sons, Kirkcaldy*....	£6,077 0 0
Joiners : D. Wishart & Sons, Kirkcaldy*..	1,673 2 3
Plumbers : H. Hutchinson & Sons, Kirkcaldy*	391 0 0
Plasterer : W. Grant, Kirkcaldy*	669 0 2
Slater : W. Cant, Kirkcaldy*	133 0 4
Asphalt : A. Meldrum & Sons, Kirkliston, Glasgow*	120 6 2
Glaziers : J. Haston & Co., Kirkcaldy*....	435 4 10
Gas Engine and Suction Plant : National Gas Engine Co., Dundee*	273 3 0
Dynamo and Electric Light : O. Melville, Kirkcaldy*	194 10 4
Iron and Steel : P. & W. MacLellan, Glasgow*	880 2 11
Stairs, Railings, and Grates : Barnet & Morton, Kirkcaldy*	123 12 1
Tile Work : Allan & Sons, Edinburgh*	623 0 0

LITHERLAND.—For paving, etc., works, Bridge-road, for the Urban District Council. Mr. A. H. Carter, Surveyor, Public Offices, Sefton-road, Litherland :—

Chadwick, Leeds-street, Liverpool* £125 3 3

PENDLETON.—For erecting a bridge, for Clitheroe Rural District Council. Mr. T. Rawcliffe, Surveyor, Bradhurst, Aighton, near Whalley :—

W. Speak, Wiswell, Whalley, Blackburn* £278 2 9

PENYGAWSI.—For 234 lineal yds. of 15-in. diameter stoneware-pipe sewer, etc., for the Llantrisant and Llantwit Fardre Rural District Council. Mr. Gomer S. Morgan, Surveyor, School-street, Pontyclun :—

Oliver Bros. ..	£125 5 0	E. D. W. Evans	£97 14 3
R. Webb.....	118 7 3	T. Williams ..	96 9 1
B. Chaplin & Co.	114 17 10	W. John.....	95 14 0
G. L. Morgan..	112 13 0	John & West, Pwysdy, Llantrisant*	93 12 0
J. Jenkins	110 5 3		
H. Ringham ..	108 19 8		

[Surveyor's Estimate, £115.]

REDDITCH.—For erecting a new needle shop at Washford Mills, for Messrs. Henry Milward & Sons. Mr. Francis F. Baylis, architect, 18, Unicorn-hill, Redditch :—

C. H. Hunns & Sons, Redditch* £4,666

STANLEY.—For widening Houghal Burn Bridge, near West Shield Row Colliery, for the Urban District Council :—

W. Ayton & Sons	£105 11 6
R. C. Birtley, Stanley, R.S.O.*	95 4 3

STRATFORD-ON-AVON.—For painting and other work to the workhouse buildings, for the Guardians of the Stratford-on-Avon Union. Mr. Albert H. Callaway, Architect to the Guardians, Union-chambers, Stratford-on-Avon :—

E. Smith	£226 10 0	S. B. Marriott..	£175 17 5
W. Bolt	195 0 0	Pitt & Co., Ltd., Dudley*	159 18 0
Fincher & Co..	195 0 0		
E. J. Callaway..	180 0 0		

TANCREDSTONE.—For erecting a farmhouse at Upper House. Mr. H. Thomas, architect and surveyor, 9, Victoria-place, Haverfordwest :—

W. Morgan	£565	Davies & Francis, Roath, Cardiff*	£470
W. J. Evans	498		
T. Williams	490		

TERRINGTON ST. CLEMENT.—For the erection of cattle-sheds, etc., for Mr. S. F. Beck. Messrs. Walker & Walker, architects, Wisbech and Terrington :—

Barnes & Co.....	£158	R. Eggleton, Terrington	£101
G. Hornigold	120		

UXBRIDGE.—For constructing new sewers, etc., in Harefield-road and High-street, for the Urban District Council. Mr. W. L. Eves, Surveyor, 54, High-street, Uxbridge :—

F. Osenton, Staines*..... £989 6 3

WOLVERHAMPTON.—For erecting new wing to science building and alteration and painting at the Grammar School, for the Governors. Mr. J. Hutchings, A.R.I.B.A., architect and surveyor :—

R. Speake & Son	£1,629 0	T. & S. Ham....	£1,508 0
H. & F. Hallett	1,613 0	T. L. Jones	1,490 0
J. Herbert	1,577 0	H. Gough & Son	1,466 0
G. Cave & Son..	1,589 0	H. Willcock & Co.....	1,457 10
T. Mason	1,545 10		

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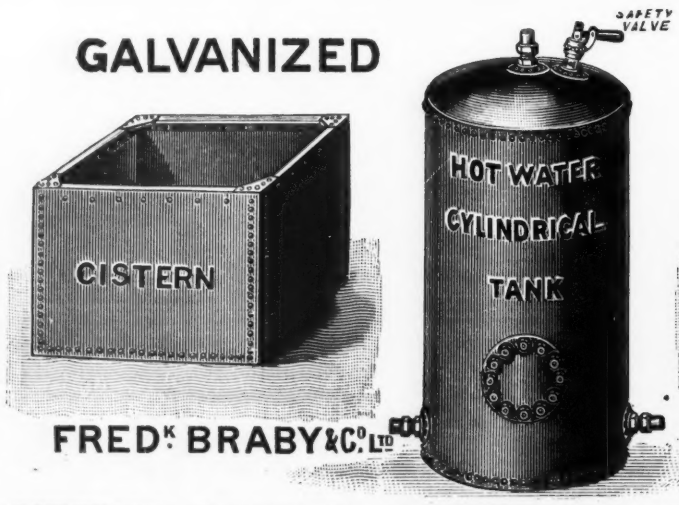

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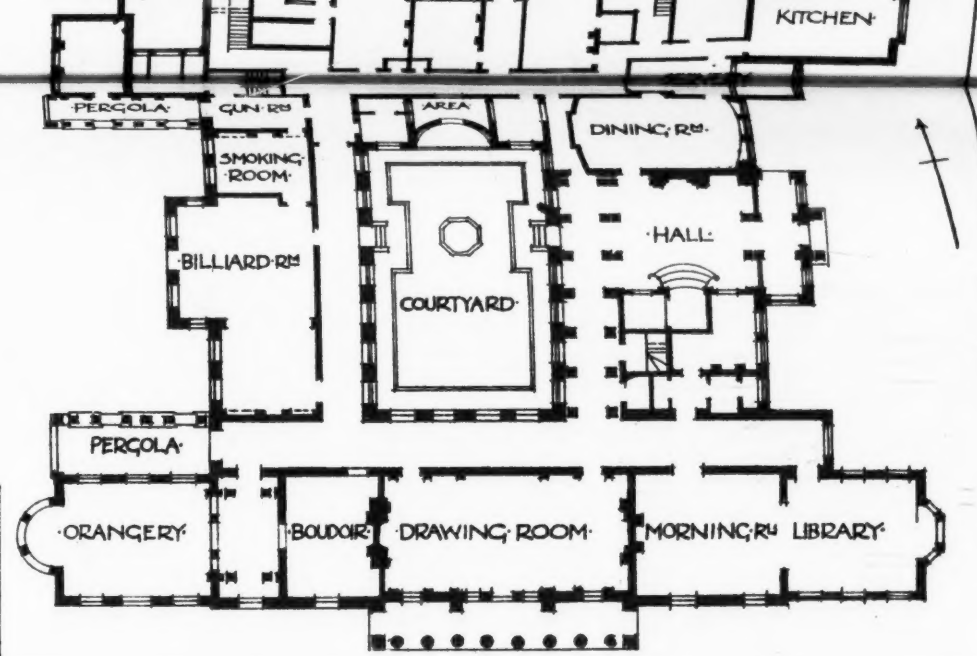

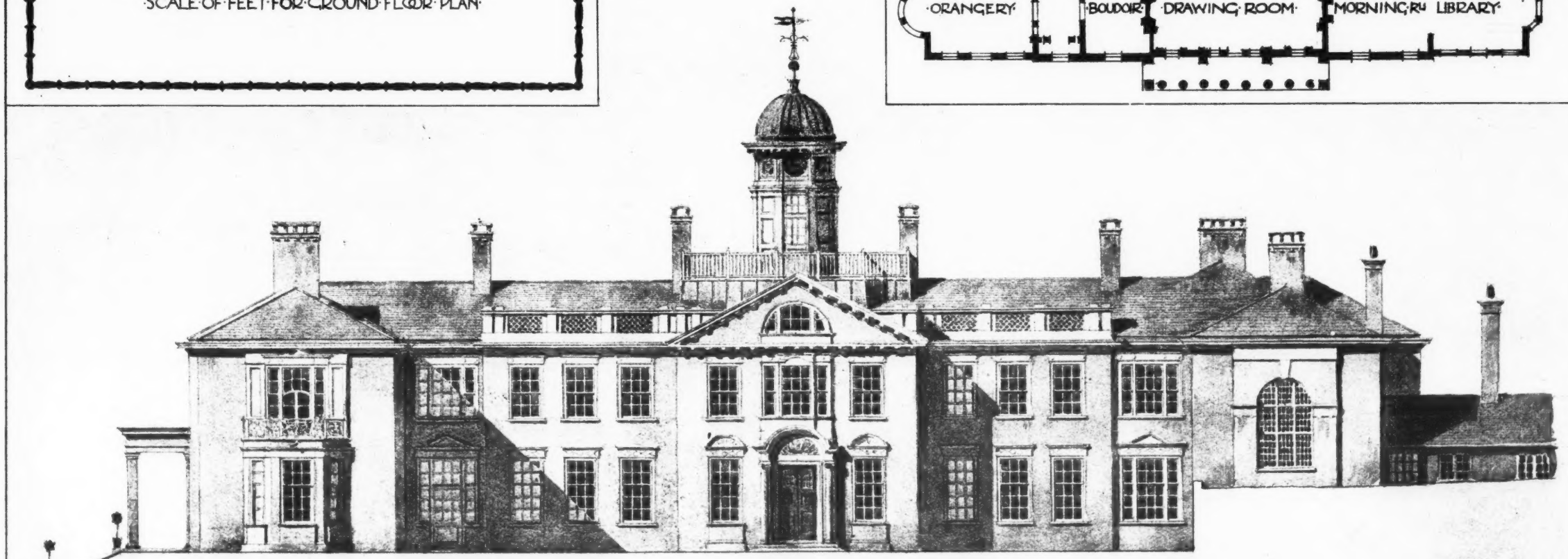

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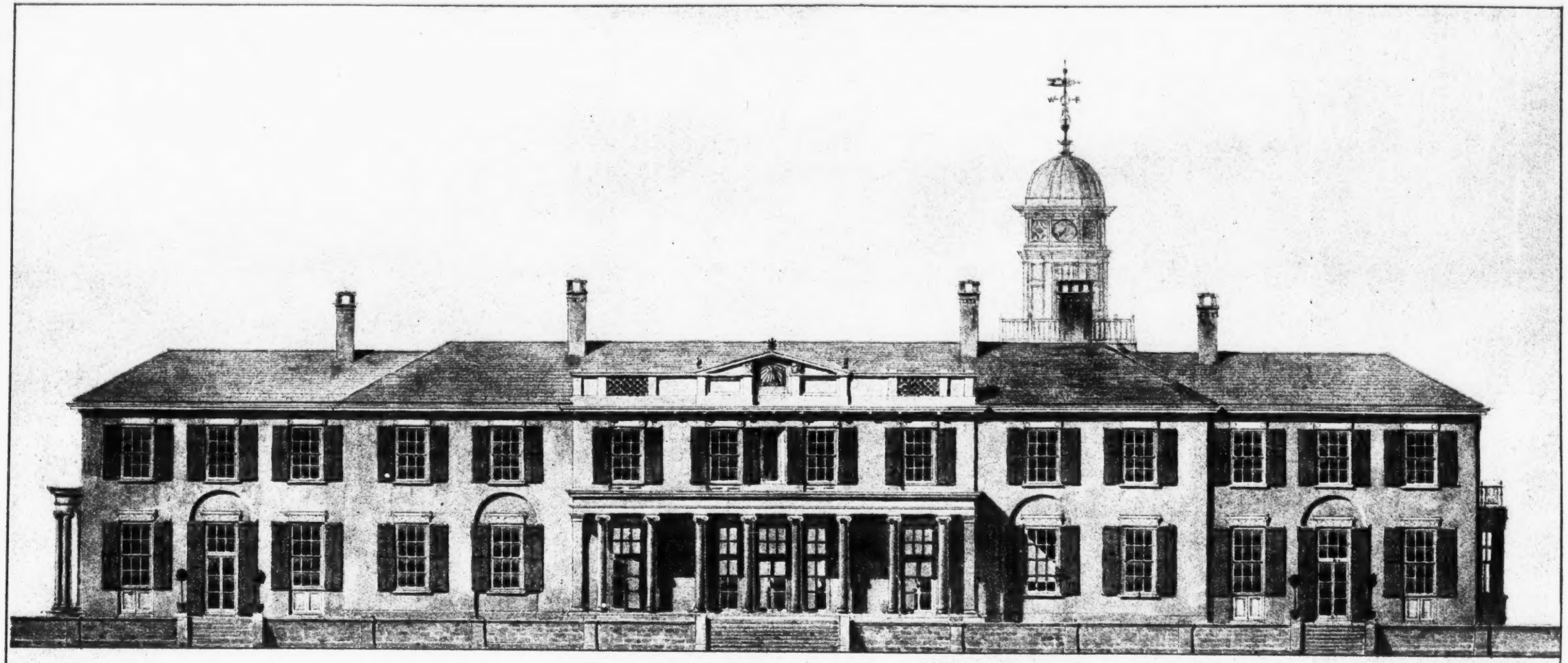

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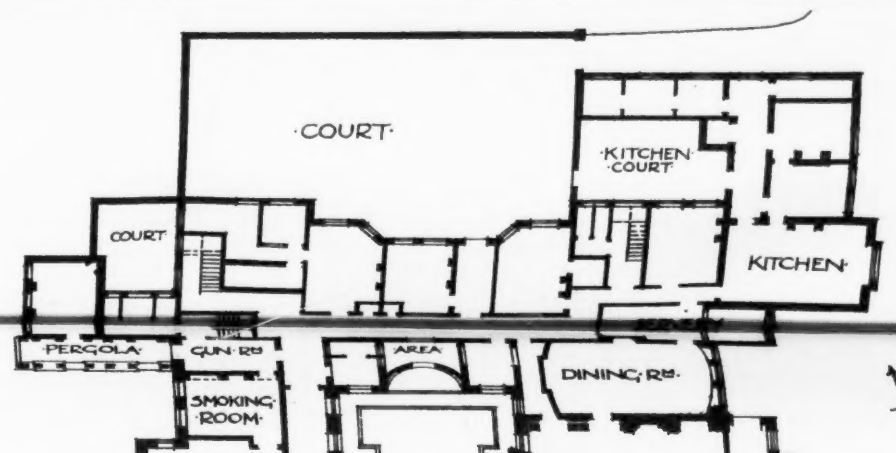

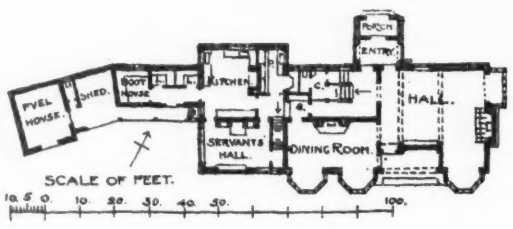

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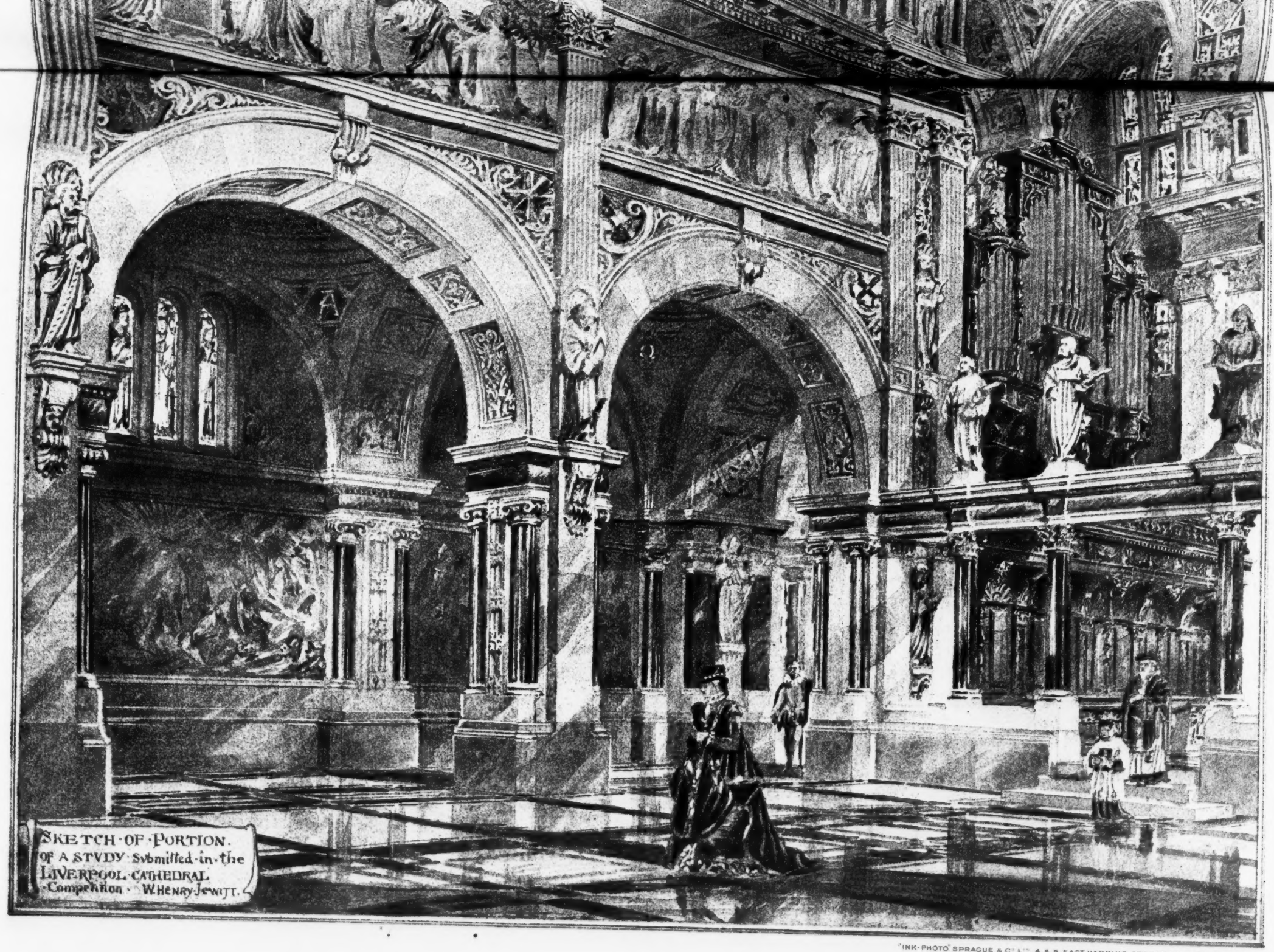

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